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ABSTRACT

A review of the literature on improving college instruction and improving college and university instructors produces two conflicting reactions. First, there are many fascinating and encouraging innovations being undertaken to raise the quality of college teaching. Second, although there has been change in higher education, it has not been extensive enough, and there continue to be deterrents to more extensive instructional reform. What are required now are institutional renewal, faculty and administrative renewal, and student renewal: in short, widespread transformation of higher education. (MSE)

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To Improve Instruction

Charles C. Cole

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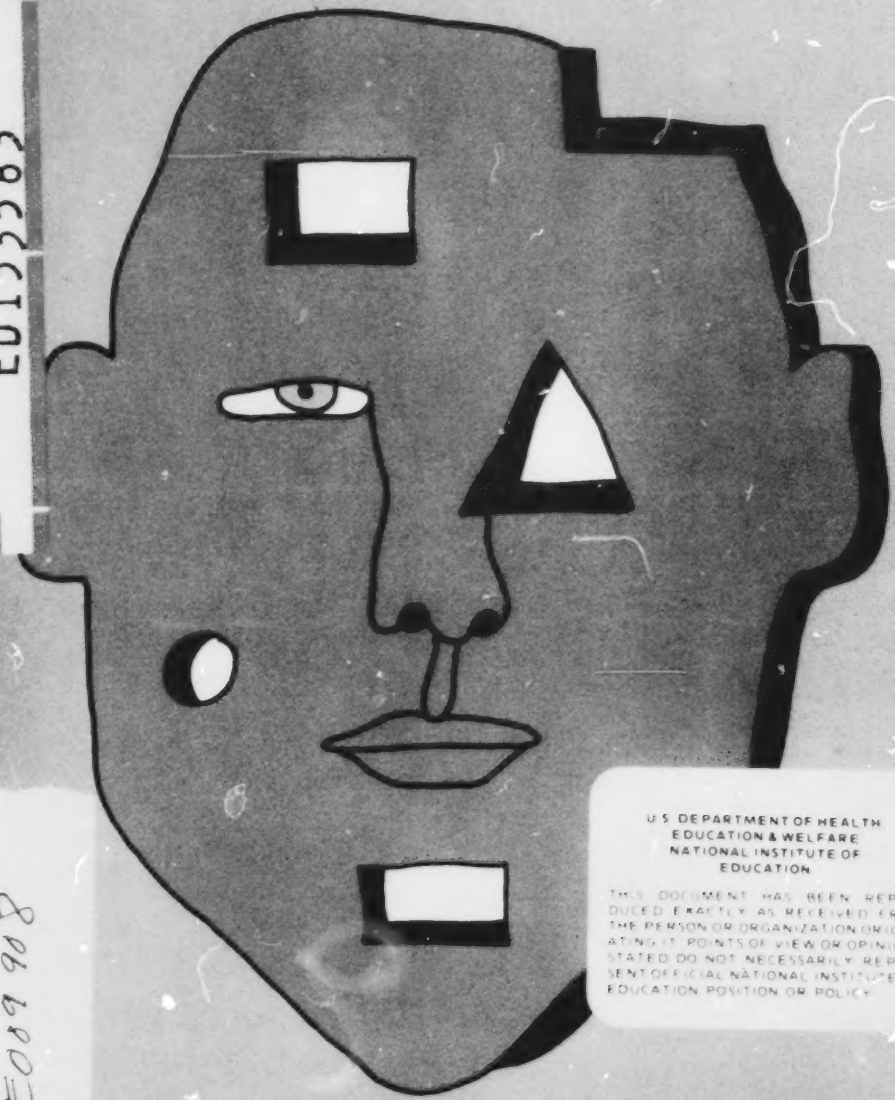

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To Improve Instruction

Charles C. Cole, Jr.

ERIC/Higher Education
Research Report No. 2
1978

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Foreword

There has been a great deal of pressure exerted on higher education institutions—both public and private—by society to revise the curricula and teaching methods to make them more congruent with social expectations. These expectations have been defined as a need for more career-oriented education, contemporary course content, and increased sensitivity to the individual student's educational objectives. In short, there has been great pressure on institutions to improve their capabilities to educate.

But to establish a climate for improvement there must exist at least four conditions. First, there must be agreement among the parties involved—in this case among administrators, faculty, and students—that change is needed. Second, the goals and objectives for change must be clearly stated and have mutual support. Third, there must be an understanding of the parties and practices directly involved and the ways they can be changed. Fourth, there needs to exist a climate that will accept failure as new techniques are tried.

There seems to be no disagreement that instructional improvements are needed, which would satisfy condition one. As for the fourth condition, it is dependent to a great extent on how well the second and third conditions are met.

Charles C. Cole Jr., executive director of the Ohio Program in the Humanities and former president of Wilson College, has addressed the second and third conditions in this report. Dr. Cole first develops a framework by discussing the basic reasons for instructional improvement; he then describes various methods that have been used to improve instruction. The methods include both faculty development as well as new instructional techniques. It is suggested that there is no single remedy that will uniformly improve instruction; rather, several approaches are described that could be tried. What techniques are actually employed will depend on an institution's assessment of its educational objectives and instructional needs.

Jonathan D. Fife
Director, ERIC Clearinghouse
on Higher Education

Contents

Introduction 1
The Rationale for Instructional Improvement 4
Institutional Reasons 4
Reasons Related to Faculty 6
Reasons Related to Students 8
Societal Reasons 9
Improving Instruction by Improving Instructors 11
The Marks of a Good Teacher 12
New Concepts of Learning 13
Varieties of Faculty Response 15
The Need for a Systematic Approach 15
Importance of Positive Attitudes 16
Models of Faculty Development 17
Implications for Institutional Change 19
Reasons for Faculty Resistance 20
Strategies for Gaining Faculty Acceptance 20
Types of Programs to Improve Faculty 22
Self-Initiated Plans 23
Other Programs Apart from Faculty Development Centers 23
Centers for Faculty Development 27
Interest of Professional Associations 29
Sources of Financial Support 30
Summary 31
Examples of Innovative Instructional Methods 33
Lectures 33
Discussions 34
Seminars 35
Independent Study 36
Self-Instruction 36
Instructional Technology 37
Computer-Assisted Instruction 39
Computer-Managed Instruction 40
Programmed Instruction 41
Television Instruction 41
Multi-Media Instruction 42
Videotape and Videodisc 42

Contract Learning 43
Experiential Learning 44
Module Instruction 46
Audio-Tutorial System 46
Personalized Self-Instruction 47
Other Methods 50
Research on Improving Instruction 54
The State of Current Research 55
Examples of Relevant Studies 56
Research on PSI 58
Research on Faculty Development Programs 59
Conclusion 62
Bibliography 66

Introduction

This report provides a summary of innovative programs to improve instruction occurring between 1971 and 1976. It also reviews the literature published during those five years dealing with the rationales, objectives, and strategies for instructional improvement. The study is based on two fundamental assumptions: there is a need in higher education to improve instruction, and there are practical and achievable ways by which it can be improved. It would appear that the advisability of improving instruction is one subject on which both faculty members and administrators can agree, if for different reasons; however, there is not the same extent of agreement about how that goal is best achieved.

Instruction can be defined as the planned, purposeful effort on the part of postsecondary institutions and their faculties to facilitate and enhance learning. Although the traditional notion of instruction as the conveying or imparting of information, skills, knowledge, ideas, and interpretations from a teacher to a student may still describe what occurs in many college classrooms, educators, in increasing numbers, are dissatisfied with that limited view. A more sophisticated approach is represented by Gagné's definition of instruction as "the set of planned external events which influence the process of learning and thus promote learning" (1974, p. 4).

Teaching is considered an art by some and a craft by others. Hart calls it "a humane discipline" (Buxton and Prichard 1975, p. 189). Eble considers it "one of the most natural and primary of human acts" and a way of "opening up worlds" (1976, pp. ix, 171). I prefer to think of it as a way of illumination, a creative process whereby sparks fly and the minds of both instructor and student glow. Teaching is assisting another to "come to fullness in the light of understanding" (Jones 1974, p. 438).

The word innovative refers to that which is new or appears to be new in a particular institutional setting. Frequently, it is used as a synonym for modern, experimental or untried, the opposite of traditional. It is any change "which represents something new to the people being changed" (Havelock and Havelock 1973c, p. 3). Because of the great diversity in higher education and the different stages at which institutions have developed, what is considered innovative on one campus may be regarded as old-fashioned at another. Postle-

thwait's audio-tutorial approach, for instance, is a relatively new instructional feature at many institutions, but it has been employed in biology at Purdue University since 1961.

Innovation does not automatically mean a contribution to the improvement of instruction or the enhancement of learning. All change is not progress. As Bonham has indicated, "One must . . . be particularly diligent, in times of bandwagon reform and easy enthusiasms for nontraditional patterns of learning, to look at each case with special discrimination, and not to think that any change is necessarily a genuine step forward" (1974-1975, pp. 11-12). However, the absence of innovation or interest in change suggests a closed, static system. At a time when revolutionary change is occurring in so many aspects of our lives, and especially in view of the knowledge explosion and the maturing of technology, it would seem sound for colleges and universities to be open to the potential for improvement that innovation can create.

Efforts to improve instruction can take different forms. They include: (1) strengthening the skills and augmenting the knowledge of the instructor; (2) enabling a faculty member to alter attitudes or transform personality to teach more effectively; (3) changing the teaching methods; (4) changing the course content or the curriculum; (5) changing the attitude, motivation, or response of the student; and (6) modifying the physical setting in which instruction takes place.

This report focuses on two different but related areas where, currently, major attention is being directed toward improving instruction: (1) faculty development and (2) innovative teaching methods. The most significant way to improve instruction, it is felt, is by upgrading the quality of those who are teaching and by enhancing the effectiveness of their teaching methods. The impact of and the concepts behind faculty development programs are reported on because it is such a rapidly expanding activity and because, according to Smith (1976), its current status in the United States is not well known. In Centra's view, approximately one-half or slightly more than half of all postsecondary institutions currently provide some type of program or set of faculty development activities (1976). Some 500 formalized faculty development centers, institutes, or divisions are currently in operation (Simerly 1976, p. 1). Variations among them result from differences in philosophy, assumptions, and approach held by those associated with them.

Some of the most promising teaching methods are those which either use instructional technology or which place more responsibility

for learning on the student. Contract learning, experiential learning, and personalized systems of instruction (PSI) are attracting wide interest. No single instructional style meets the needs of all students.

Research on faculty development and on innovative instructional methods has been inadequate and unsystematic. Prior to 1976, results on teaching methods were inconclusive and contradictory. However, there now appears to be significant evidence that PSI is superior to conventional teaching methods (Taveggia 1976). Research on faculty members reveals that personality and superior teaching performance are highly correlated.

Also included in this report are consideration of the rationale for the improvement of instruction, a review of relevant research studies, and recommendations for the future.

The Rationale for Instructional Improvement

There are ideas whose time has come; there are others whose time is long past due. Systematic and extensive innovation in instructional improvement, it would appear, has been long in coming and there are many reasons for urging it upon faculties and administrations. In the literature about the subject published in the 1970's, there are at least 20 identifiable reasons justifying more time, attention, and financial support to the improvement of instruction. The rationale for instructional improvement is found in four different but interconnected areas. There are reasons related to institutions of higher education, those related to faculty members, their professions, disciplines, and training, those attributable to students, and those related to society and societal forces. A consideration of the scope and variety of arguments for undertaking efforts to raise the quality of instruction is useful in helping one gain an understanding of the importance and usefulness of this activity.

Institutional Reasons

Most of the authorities who have written about the improvement of instruction, such as Eble (1972, 1976), Gaff (1975, 1976), Mayhew (1976), Berquist and Phillips (1975, 1977), have referred to those factors in the colleges and universities that have contributed to the realization that instruction must be improved. There has been strong dissatisfaction with things as they are and a growing realization that change is needed, that institutions must re-examine their goals and philosophy. Many who have studied higher education have observed that in the past the quality of instruction, has received inadequate attention or has been neglected. In other instances, where attention to improving teaching has been adequate, the reward system has continued to overvalue research and publication and undervalue teaching. As Eble observed after visiting many campuses, "I have found wide support for the belief that the values dominant in higher education fail to give adequate support to teaching" (1972, p. 179).

The institution of higher learning is faulted by Ashby for not having devised efficient built-in mechanisms for change (1974, p. 15) and by Mayhew for not enabling the newer instructional techniques to play a central role in collegiate education (1976, p. 4). It is criticized by Eble (1971, p. 2) and Whitfield and Brammer (1973, p. 1) for fail-

ing to develop faculty members as teachers and for not seriously trying to improve. It is reported by Cross (1976, p. 9), Milton (1973, p. 128) and Lindquist (1974, p. 321) because they consider the traditional teaching methods antiquated and no longer fully responsive to the needs of the 1970's. As Holtzman puts it:

> These time-honored traditions, instructional methods that have served us well in the past, are currently being questioned in many quarters, even among faculty members themselves. There is a call for education that is less routinized and more personalized, for education that not only imparts adopted knowledge but implants adaptive thinking, for education that does not just master belatedly the solutions of the past but that solves creatively the problems of the present and foresees realistically the issues of the future (Messick 1976, p. 24).

A second institutional reason for improving instruction is related to the current economic depression and the financial constraints gripping colleges and universities. As enrollments level or drop, as some institutions experience retrenchment, as some even fight for survival, it is necessary to counteract the tendency to cut back on experimentation and innovation. Further, as Boyer and Crockett point out, it is desirable to shift faculty toward more institutional identification and increase college and university support for good teaching (1973, p. 341).

Third, as Miller (1972, p. 21) and others have indicated, the intensified competition among institutions for students requires that they strengthen their claim of offering outstanding teaching and responding more effectively to new social needs. Any marginal advantage that an institution has in the scramble for students can be important. Colleges where superior instruction is the rule rather than the exception, and where it is sufficiently recognized and rewarded, can have an advantage in the competition for future students and support.

Another reason for emphasizing better instruction is based on the fact that, with few exceptions, graduate schools have failed to devote sufficient attention in their doctoral programs to the subject of teaching. Milton (1973) and others have commented that traditional graduate educational experience is directed toward research and toward a narrow specialization within an academic discipline. Scholars maintain that the amount of preparation required to become expert in a particular field is such that there is little time left for adequately preparing future professors in instructional techniques (Brown et al. 1973, p. i). Thus, while faculty are well trained they are "not necessarily well educated" (Dougherty 1974, p. 522). This situation produces a serious problem:

> The disparity between the professor's preparation as a scholar and the task he performs injects ambiguity into his claims to status as a professional. Unlike the doctor, lawyer, or engineer, the beginning college professor may lack experience entirely in the practice of his art until the day he faces his first college class. (Whitfield and Brammer 1973, p. 5).

The result is a condition that some consider a serious anomaly. According to Mandelbaum. "Few professions give less training to new members than does university teaching. . . . Graduate training instills just those habits that are not suitable for teaching undergraduates" (*The Chronicle of Higher Education*, October 6, 1975, p. 24).

Another reason for seeking to improve instruction results from the very bigness of many institutions. As the size of some campuses increases, the concern for individualization in teaching also increases. Certain things that were taken for granted on some campuses—the interest in the person, the capacity to respond to individual needs, unanticipated crises, the sense of community and collegiality—have become more and more important either to maintain or regain when the academic enterprise becomes large. We pay a price for bigness and one of the prices is the loss of individuality in the teaching process. Representative of this point of view is the assertion, "the mass lecture section is the ultimate denigration of the human personality" (Goodman et al. 1974, p. 197).

Reasons Related to Faculty

Of the reasons for improving instruction that involve faculty, their characteristics, and actions, the most persuasive is the thesis that undergraduate teaching is not "a true profession" (Sanford 1971, p. 359). The conflict between research and teaching appears to be a continuing one with little incentive being given to the faculty members to address themselves to eliminating teaching deficiencies. The primary faculty identification with their discipline tends to detract from loyalty to the employer institution. Eble, who has probably discussed this problem with more professors than anyone else, claims there are comparatively few faculty "who incline toward developing teaching as an art" (1972, p. 25). Gaff agrees and asserts:

> Our colleges and universities are now staffed by faculty who, in general, have never studied the history of their profession, are unfamiliar with the topography of the educational landscape, are unaware of the professional literature in higher education, and have never been expected to formulate systematically their own philosophies of education or their views about teaching and learning (1975c, p. 16).

This situation becomes intensified as a result of the current decline

in faculty mobility, the prolonged institutional tenure of many professors, and the overproduction of Ph.D.'s. Sally S. Gaff has described the problem succinctly:

> Faculty members are asking themselves how they, as individuals, can continue to be effective, creative, and challenged, with fewer opportunities for mobility and more likelihood of spending a large portion of their teaching life at a single institution . . . high quality and excellence in teaching have become more than ideals; they have become survival skills, both for individuals and organizations (1976, p. VII-1).

These circumstances affecting academic men and women have combined with the pressures created by retrenchment difficulties, institutional uncertainties, and changes in the disciplines to produce a malaise in the teaching profession that has serious implications. As a result of their interviews with 500 faculty members, Freedman and Sanford found a "pervasive unease and confusion," a "lack of professional identity," and a "sense of vulnerability" that gravely threatened their effectiveness (1973, pp. 3, 13).

One other possible reason for increasing the attention to ways of improving instruction is related to the rise of unionism. It has been suggested that faculty unions may look upon faculty development programs as fringe benefits and insist on their availability and use for retraining purposes in instances where cutbacks are contemplated. Unionization seems to offer both threat and promise for quality teaching. Gaff believes that "Faculty unions may lead to contractual circumspection of the practice of teaching, but could also become a force for collective reappraisal of teaching" (*Resource Notebook* 1976, p. v).

Apart from these considerations about faculty, however, there is another reason justifying efforts to improve instruction. There is continued need on the part of persons who deal with ideas and fields of study where knowledge is rapidly expanding to update themselves, engage in professional growth, and fill in gaps in their understanding. Even the best instructor must continue to grow intellectually, to learn, to adapt to new circumstances, new challenges. An excellent discussion or lecture yesterday does not guarantee that there will be one tomorrow. The imperative for individual improvement includes sharpening of teaching skills, continued competency in one's own field, becoming and remaining knowledgeable about those aspects of a discipline outside of one's specialization, gaining new information about human behavior and learning theory, and learning about trends in society at large.

Reasons Related to Students

There are several considerations connected with students that call for increased effort to raise the quality of instruction. As Cross (1976), Eckert (1973), and others have pointed out, the college and university campuses in the 1970's contain "new" students, a more diversified heterogeneous group than ever before. Students from minority backgrounds, older students, those who are working, those who are attending part-time, those with physical handicaps, those without a college-going tradition in their families require nontraditional instructional approaches. It has been said that different types of students respond more positively in different types of learning situations (Diamond et al. 1975) and that in the case of the new student generation, they appear to perform better "when individual instruction is developed to accommodate individual learning styles and individual needs" (Roueche 1972, p. 119). Thus, faculty members face the difficult adjustment to a new instructional climate and a new clientele.

The intensified vocationalism of students in the 1970's also argues for attention to instructional improvement. Students must be persuaded that what they are asked to study will have some practical value for them. Faculty members cannot sit back and assume ready acceptance of their subjects and their teaching methods. Everything studied in college need not have a cash value, but it is important that faculty be aware of student concerns about the practical value of what they are asked to learn.

Third, the rise of student consumerism means that faculties and administrations must be concerned with quality education. This is an age of litigation and students are not reluctant to sue their alma mater when they think they are not getting their money's worth. In recent years unhappy students have filed suits against the University of Bridgeport, Syracuse University, George Washington University, and Southern University (*The Chronicle of Higher Education*, November 24, 1975, pp. 1, 10). According to one Carnegie Commission study, one-third of college and university students were either dissatisfied or very dissatisfied with the quality of their classroom instruction (*Reform on Campus* 1972, p. 86). The rise of student consumerism helps explain the increased interest in faculty evaluation.

The attrition rate of students is another consideration. When students drop out of college, it is not always their fault. Sometimes it is the result of uninspired teaching, poor advice, or programs insufficiently responsive to their needs.

The student activism of the 1960's has had significant implications

for the future of campus instruction. By that I mean more than the concern over Vietnam, dislike of secrecy in government circles and hostility to the so-called military-industrial complex. Student activism went beyond political and economic issues. There were philosophical and educational overtones to the student questioning of authority. There were demands for more educational experiences outside the classroom, for experiential education, for greater relevance. Activists praised the emotional, the affective, the spontaneous, the joyful elements in life not easily subjected to rational analysis. And the universities began to respond by innovating, reducing rigidities and requirements, increasing student choice. Although the activist exterior has subsided, the hard core of student concern for nontraditional approaches to learning still persists and it behooves professors and administrators to respond creatively to that demand (Buxton and Prichard 1975).

Societal Reasons

There are factors to consider that transcend the campus community. Our society is experiencing a revolution in terms of the knowledge available to us and the power that technology gives us. The information explosion and the scientific and engineering advancements have made possible an instructional technology not dreamed of a generation ago. There are also elements of instability that must be reckoned with: the calamitous energy shortage, the exhaustion of vital natural resources, intensified prejudices, and increases in the potential for violence. All these developments as well as other changes in society have implications for curriculum and for teaching. Furthermore, it is imperative that faculty members have opportunities to learn about innovations that have implications for their teaching (O'Banion 1972, p. 101).

The changes occurring in society, especially our improved understanding of the learning process and the emphasis on the whole person, have particular impact for the academic profession. As Martin (1975, p. 194) observes, the high percentage of faculty who were trained and socialized in the 1950's and 1960's, when the emphasis was on individual growth and institutional expansion, are especially ill-prepared to adapt to the current classroom crisis.

In addition, the current emphasis on accountability and the push for evaluation are other societal factors that call for increased attention to instructional improvement (Miller 1972, p. 4). Parents, legislators, trustees, and the general public believe they have a greater stake

in the educational enterprise, are more articulate when discussing what they are paying for, and want to know why achievement is frequently less than expectations.

Finally, Maier's reason for encouraging instructional improvement deserves pondering. "Participation in new ways of teaching," he writes, "would preserve the democratic ideal" (1971, p. 725). There are implications in this point of view that touch on traditional faculty practices and attitudes. The conventional type of college and university instruction rests on the assumption that the professor is an authority figure who knows what should be studied and whose word must not be questioned. Maier implies that such an instructor-student relationship is more congenial to an autocracy than a democracy, and that faculty no longer can claim to know all the answers or ignore changing circumstances. At present, faculty have a responsibility to make their discipline as attractive as possible and to communicate what they know as effectively as possible but in an atmosphere that acknowledges the dignity of the student and his involvement in the educational process.

One of the best summaries of the rationale for improving instruction is that written by Berquist and Phillips:

> Institutions of higher education face the harsh realities of decreased funding, steady or declining enrollment, and limited faculty mobility, together with demands for accountability voiced by students, parents, and state and federal officials. Since the teaching enterprise is central to higher education, faculty in particular are being asked to re-examine their personal and professional attitudes toward classroom instruction and toward their relationships with their students. Many faculty are also being asked to consider training in new classroom procedures, as well as possible reorganizations of departmental structures and governance systems (1975, p. 3).

Improving Instruction by Improving Instructors

Accepting the need to improve instruction is the first step. The next is ascertaining what in the instructional process has to be improved and how one goes about improving it. An impressive number of books and articles have been written that try to make sense of the problem of instructional improvement. Some authors have constructed models for accomplishing faculty improvement along with strategies and tactics necessary to achieve their goals. This section considers the major philosophical and psychological considerations or elements that might be called the building blocks for improving teaching.

It must be emphasized that this focus is on only two major parts of the whole: faculty development and innovative teaching methods. In their helpful *Handbooks,* Berquist and Phillips maintain that faculty development "is primarily an attempt to improve the quality of teaching taking place" (1975, p. vii). One useful definition of faculty development is "an instructional process which seeks to modify the attitudes, skills and behavior of faculty members toward greater competence and effectiveness in meeting student needs, their own needs, and the needs of the institution" (Francis 1975, p. 720). But since teaching improvement can occur apart from structured faculty development programs, it is essential to examine the process of teaching as well as the teacher. (I have purposely omitted consideration of evaluation because that subject has been adequately addressed in Smith's ERIC/Higher Education Research Report *Faculty Development and Evaluation in Higher Education* (1976).) The connection between curriculum change and instructional improvement has also been passed over to concentrate on the universal factors in instruction that apply regardless of the subject area of course content. Obviously, one can improve instruction by updating course content, redesigning syllabi, and constructing new interdisciplinary approaches, but these steps by themselves do not insure excellent instruction. The curriculum tinkering of the 1960's did little to change those teachers who were mediocre to begin with and who continue to be so whether enrollments rise or fall.

The cornerstones for any conceptualization of this subject are the simple but crucial assumptions: improvement is possible, and good teaching can be taught. According to Sanford, "College teaching most certainly can be improved, but efforts at reform must be based on an

understanding of the nature of the trouble and be aimed at conditions that can be changed" (1971, p. 358). McKeachie (1969), Gaff (1975a) and Eble (1972, 1976) emphasize the importance of the concept of instructional improvement. According to Gaff, teaching behavior is a "learned complex of knowledge, attitudes, values, motivations, skills, and sensitivities" (1975, p. 4). No matter how good a person is in the classroom or laboratory, he or she can become better. No matter how effective a particular teaching method is or has been, it can be enhanced.

These experts and others also agree that the quality of education depends considerably on the quality of those who are instructing and that faculty members are the "most important educational resource" of institutions (Gaff 1976, p. 62). Therefore, improving the quality of faculty is closely related to improving the quality of instruction.

The Marks of a Good Teacher

Many studies have been undertaken to identify the marks of a good teacher. Some of the best recent surveys on this subject are by Hildebrand (1973), Wilson et al. (1973), Romine (1974), Eble (1976) and Stice (1976). In practically every report the following characteristics of excellent instruction emerge: the effective faculty member knows the subject matter, has high-level ability, is well-prepared, is enthusiastic, approachable, warm and friendly, has a sense of humor, relates the subject to current concerns, makes effective use of teaching aids, shows genuine interest and concern for his or her students, and encourages their questions and opinions. Enthusiasm is the quality most frequently mentioned as essential by those writing on the subject. Outstanding college instructors themselves have pointed to how valuable this quality is. Buxton, for instance, has observed, "enthusiasm based on commitment seems to be the sine qua non of effective teaching (Buxton and Prichard 1975, p. 122).

There is a difference in how faculty members and students perceive good teaching. The former emphasize intellectual and scholarly competence while the latter are more concerned with qualities of personality. What is particularly significant is that a college teacher's likelihood of being considered effective is influenced by the extent to which he or she interacts with students outside the classroom. The continuing contact and interest in students appears to increase undergraduates' appraisal of classroom effectiveness (Gaff 1973, pp. 610, 615).

It is clear that attitude and personality play a vital part in good

instruction. Baird, for instance, has declared, "the characteristic ways an instructor teaches his class can have important consequences for his students' learning, satisfaction and development. His teaching style reflects his educational values as well as the goals he hopes his students will attain" (1973, p. 15). It is almost a cliché that what a teacher is is more crucial than what a teacher does. In addition, a number of educators have observed that what a faculty member does beyond his formal course responsibilities may have more impact on student learning than all his lectures. As Weidner has asserted, "the time is gone when higher education is a thing that takes place in the classroom" (Milton 1973, p. 93).

New Concepts of Learning

If new concepts of instruction are emerging, so too are new concepts of learning. Just as teaching is no longer considered as merely the transfer of information from the brain of the professor to that of the student, learning concepts no longer picture students as passive receptacles. There are different learning theories competing for acceptance. The most persuasive currently are the cognitive field theory, the stimulus-response theory, and a third school that seeks to combine the strongest elements from the other two (Roueche 1972, p. 31). However, the main result of the contributions of Bloom, Bugelski, Bruner, Skinner, Rogers and others has been the acceptance of a more sophisticated view of the complexity of both the process and product of learning. Eble has listed the main principles of current learning theory in the most concise fashion:

> Learning is an active, continuous process . . . . takes place in terms of stimulus and response . . . . is affected by the learner's set. . . . Time and conditions affect learning greatly. . . . Association is an important aspect of learning. . . . Progress in learning is not uniform. . . . It is possible to learn how to learn (1976, pp. 150-151).

Furthermore, experts emphasize that there are different learning domains (cognitive, affective, and motor) and there are types of learning that differ with respect to the circumstances under which the most is accomplished. Despite their differences, most experts agree that teaching should facilitate and enhance learning, that through learning the individual can better realize his potential, and that to be most effective, learning requires the active participation of the student. This last concept has been best expressed by MacKenzie (1970) who calls learning "a dynamic and interactive process, in which the role and experience of the student are vital components, in which he

should contribute as well as receive" (p. 46). Cross (1976) suggests the same thing when she points out that what the student does in the learning process is more important than what the instructor does (p. 54).

If, then, learning is primarily an activity done by an individual rather than something done to or for him, it follows, according to educators such as Postlethwait (1972), Sherman (1974) and Bogue (1974), that the more active the student is in the process, the more effective will be the learning that takes place. The ultimate ideal, at least for some, is to make students the producers of their own learning and to emphasize learning how to learn rather than content mastery (Gartner and Sunderland 1974, pp. 75-83).

More significant in its implications for improving instruction is another concept related to learning theory, namely that cognitive learning is not enough. Knowledge, comprehension, analysis, and synthesis are only part of what must take place. There is also affective learning, the receiving, responding, and valuing of stimuli (Roueche 1972, p. 90). There is more emphasis now on those things that go beyond the cognitive, on attitudes, feelings, relationships, values. One reason offered for this emphasis is that at a time of rapidly expanding technology, it is necessary to free oneself from the notion that there is a fixed body of knowledge. Another reason is that higher education's customers are no longer satisfied with part of the totality of life. As Ashby has indicated, there are three different kinds of skills: those that deal with ideas, those that deal with things, and those that deal with people. The current university generation is calling for more emphasis on the skill of working with people (1974, p. 143). Along the same lines, Cross (1976) has taken the position that the content and goals of instruction should be enlarged to include interpersonal the manual skills as well as intellectual ones.

The challenge of improving instruction hinges on the fact that there is no single way to accomplish this goal. As Johnston observes, "what constitutes successful teaching for one individual may be woefully inadequate for another" (1975, p. 478). Axelrod (1973a), Eble (1976), and others have provided ample descriptions of the varieties of professorial classroom preference—the didactic mode, the evocative mode, the drillmaster, the content-centered, the instructor-centered, the intellect-centered, the person-centered (Morris 1970, p. 43). Every approach has its devotees and masterful examples. What seems more important than forcing acceptance of a single style is a greater realization that instruction becomes more effective when individual differ-

ences in the students' knowledge and development level are considered (Messick 1976).

Varieties of Faculty Response

But if there are "four-and-twenty ways" to teach effectively, there are also deeply divergent faculty responses to the changes that have occurred in learning theory, educational technology, and student attitudes and behavior. Bloom et al. (1973b) see three patterns of faculty response to student diversity and changed opinions. There is rejection by some professors and a reaffirmation of their own ways of thinking and behaving. There is acceptance by others who embrace the new student values and reject their professional mind-sets. Still others attempt to use student values as a means to reevaluate professional viewpoints.

Simerly (1976), on the other hand, has described campuses as experiencing "a clash between traditional and emergent assumptions regarding the personal, professional and organizational needs and goals in higher education." He sees the traditional assumption as one in which the faculty member views his main responsibility as teaching a particular discipline, while the emergent assumption is that the faculty member's main responsibility should be to facilitate student learning on a wide variety of subject matter as well as about self. The traditional emphasis is that it is the faculty member who is chiefly responsible for change, growth, and development; the emergent emphasis is on administration creating conditions that promote faculty change, growth, and development (1976, pp. 11-13).

The Need for a Systematic Approach

Regardless of the differences in opinion or emphasis, whether educators are talking about new teaching techniques or faculty development programs, one thing is clear: to be successful, innovation must be systematic. According to Toombs, "planning for faculty development must be programmatic and encompass a large framework of ideas, issues and practices" (1975, p. 701). There must be a comprehensive overview, an omnibus approach, not a haphazard, incomplete effort. Treffinger (1973), for instance, has observed that innovation is often tried without any systematic consideration of objectives and he has concluded that failure to consider goals and purposes can lead to poor understanding of how instructional improvement should be planned, implemented, and evaluated.

With regard to systematic planning, several authors have emphasized the need for faculty members to do a better job of stating their

course objectives. There is a school of thought that maintains that every professor should clearly state the objectives for every course he teaches. Some of the advantages of stated course objectives are:

> 1. They change the instructional orientation from "what we must cover" to what a student should be able to do as a consequence of instruction. . . . 2. They permit the design of a logical and effective instructional sequence by identifying a hierarchy of objectives. 3. In original and modified form, they can be given to the student to facilitate efficient study. 4. They provide a basis for instructional rapport and communication between faculty. . . . 5. They encourage self-evaluation by the student who knows what he is expected to do. 6. They facilitate student learning efficiency . . . (Diamond et al. 1975, p. 62).

Importance of Positive Attitudes

Another crucial point that should be recognized if instructional improvement is to succeed is that whatever is being contemplated—the establishment of a learning center, introduction of computer-assisted instruction, or a new class schedule—positive faculty attitude toward the innovation is highly desirable at the outset. "Improvement will occur," Eberle has said, "when the individual faculty member sees the need for change" (1972, p. 25). "The best laid plans for academic reform will go awry," Sanford has maintained, "unless they accord with faculty attitudes and wishes" (1971, pp. 369-370). After giving 142 practical suggestions for undertaking faculty self-development, Brown and Hanger concluded, "more important than any item on the list is the development of an attitude, an awareness of the continuing need among faculty professionals to renew themselves" (1975 p. 206). Thus, securing favorable faculty support for innovation should precede its introduction.

An equally important factor in the success of a new teaching technique or a faculty development center is strong administrative support at the top. Indeed, Mayhew has called it "the most important condition necessary for innovation and change in American higher education" (1976, p. 8).

Combined with faculty acceptance and administrative support, a change in the reward system is also singled out by a number of authors as a vital factor in assuring success of instructional improvement. As long as colleges and universities and the professionals connected with them value research more than teaching, as long as mediocre instructors are kept and promoted, as long as there are inadequate incentives to experiment with new teaching techniques and to learn more about the art of teaching, as long as student complaints

are ignored, instructional improvement has an uncertain future. Berquist and Phillips have made the point well:

> Faculty will be motivated to teach only when the institution not only allows the faculty member to expand his teaching interests through creation of a supportive academic culture but also assists the faculty member to engage in this growth through provision of mechanisms for personal, professional and organizational development (1977, p. 21).

Institutional support for faculty improvement is especially imperative on those campuses facing retrenchment or serious financial constraints. When enrollments are leveling, when departments are being phased out, when salary increases have been postponed, it is incumbent on administrators and trustees to assist professors in making the necessary adjustments. Support for innovation, for upgrading and retraining become urgent. Not only is morale at stake, but also the continued effective functioning of a person who feels threatened and undervalued. Even financially beleaguered institutions must find ways to encourage instructional improvement and campus reform.

To be really effective, however, the reform must be extensive. Once the process of systematically improving instruction has begun, and once there is strong administrative support and wide faculty acceptance, with status and recognition for teaching excellence, then upgrading can be achieved throughout the institution. According to Richard, "one does not change part of a system without affecting other parts" (1971, p. 61). Improvement of instruction is not an isolated process left to a few conscientious, committed individuals to accomplish off in a corner of the campus. To succeed it must become a central concern of a sizable segment of a college or university community, receive sufficient, sustained support and take precedence over the many superficial, peripheral activities that now consume so much of the time, attention and energies of faculty, administrators, and students.

Models of Faculty Development

One set of concepts related to instructional improvement has to do with faculty development. The most elaborate and carefully thought-out models for faculty development have been devised by Gaff (1975) and by Berquist and Phillips (1975, 1977). Although these three models differ slightly, they share a common characteristic in viewing change as occurring in structure (authority and organization), process (communication, interaction), and attitude (assumptions, values, philosophies). The first model, designed by Berquist and Phillips, describes

faculty development in terms of instructional development (process), organizational development (structure), and personal development (attitude). Instructional development is composed of evaluation, diagnosis, training in both traditional and new methods, and curriculum development. Organizational development is composed of team-building, decision-making, conflict management, problem-solving, and managerial development. Personal development is composed of discussions about teaching, career and life planning, interpersonal skills training, personal growth, and therapeutic and supportive counseling (1975, p. 258).

A second model devised by Gaff uses the terms faculty development, instructional development, and organizational development. In this model, the purpose of faculty development is to help instructors acquire knowledge, skills, sensitivities and techniques that will enhance their professional growth and improve the quality of their teaching. The purpose of instructional development is to improve student learning by focusing on the redesign of courses, preparing materials, and making instruction more systematic. The purpose of organizational development is to create a better environment for teaching and learning, devise policies that support both, improve interpersonal relationships, and enhance team functioning (1975b, p. 9).

A third model appears in volume 2 of *A Handbook for Faculty Development* by Berquist and Phillips and extends some of the concepts contained in the first two models. This model maintains the divisions of attitude, structure, and process but broadens the definition of terms and adds the concept of community development, extending faculty development issues beyond the limits of individual colleges. There is more attention focused on the potential for changing personal factors that go beyond particular teaching styles (1977, pp. 6-11).

A characteristic of these models is the assumption that teaching quality can be improved when there is attention to enhancing communications among faculty members and enabling them to learn more about their own and others' teaching methods. Also characteristic of these models is the expectation that good teaching will be valued and rewarded.

Beyond the particular models used to conceptualize programs for upgrading faculty, there is another consideration that must be kept in mind. College and university faculties are heterogeneous groups at different levels of expertise and experience. Therefore, there need to be stages to the programs that serve faculty. A single approach

covering all is too simplistic. Different approaches are appropriate for different ages and for different ability and awareness levels. A particular program must address itself to the prevailing campus situation (Francis 1975, p. 730).

One of the fundamental premises found in all major models for faculty development is, "that the organization functions either as an enabling or an impeding structure and that eventually the faculty member's growth and development will be stymied unless the organization within which he functions also keeps pace" (Crow 1976, p. 3).

Implications for Institutional Change

In the recent literature on faculty development programs, there is emphasis on their ultimate connection with institutional reform. What is being implied is that efforts to improve instruction through faculty development programs have a spill-over effect that touches the entire institution. Therefore, one cannot deal with faculty improvement without eventually confronting the imperative for organizational improvement. The term organizational development refers to the long-range attempt to strengthen an institution's problem-solving and renewal procedures through more effective, collaborative management actions. Organization development focuses on the use by work teams, change agents, and others of modern theories of behavioral science as applied to institutional change (French and Bell 1973). Those theorists who advance the idea of organization development maintain that institutions must change along with individuals and that to ensure more effective teaching and learning there must be improvement in the overall functioning of the institution (Gaff 1975b, p. 75); Simerly 1976, pp. 5-6).

What is proposed by this approach is a thorough overhauling of the structure and system known as higher education on the premise that significant efforts to improve instruction can have a domino effect. The process of raising the quality of teaching leads to changes in people and especially in their relationships with others and with their institution. These changes in turn affect other things, such as departmental divisions, governance relationships, attitudes toward specialization, grading, and educational goals.

Three examples indicate the future directions in which faculty development programs may take the academic profession: Bess (1975) believes that many faculty are ready to break out of their traditional habits, change their work style, and participate in professional activities substantially different from those in which they are currently

engaged. Richardson (1975) suggests that ways be found to change existing professorial beliefs and behaviors regarding their basic notion about the nature of the educational enterprise. Fraley and Vargas (in Johnston 1975) call for a thorough reorganization of the institution, with the responsibility for instruction being transferred from academic departments to instructional systems organizations. Other divisions of the institution, such as a production division and a quality control division, would be based on the major instructional functions. These may seem like radical ideas but they may represent a prevailing view in the 1980's:

> It is time for a critical analysis of the traditional curriculum in education featuring assorted departments competing to be useful to classroom teachers. The classroom model of instruction, with its autonomous teacher-generalists, is dead because the complexity of the instructional process implies demands beyond its capabilities. The corpse of that model will linger among us for many years, a monument to an incredible underestimation of the instructional task (Johnston 1975, p. 495).

Reasons for Faculty Resistance

Such a sweeping statement is hardly representative of the academic profession in the late 1970's. Indeed, while the faculty development movement is one of the major thrusts in higher education at the present time, its acceptance is not easy, and certainly not universal. A number of writers have expressed concern over faculty resistance to the movement. Lindquist (1974) cites as reasons for objecting to change: general ignorance and inertia, the faculty feeling of threat to secured positions and old habits, to graduate research specialization, and to the assumption that certain courses, with their "coverage," are necessary for an "education." Sikes et al. (1974) list additional reasons for faculty opposition: the difficulty of demonstrating the value of change, parochialism, the lack of change-oriented concepts and skills, and discouraging policies and practices. Crow has compiled the most complete set of reasons (1976, p. 9).

Strategies for Gaining Faculty Acceptance

Perhaps because of the tenacity of faculty resistance to innovation, and to the establishment of some faculty development programs, a number of educators have proposed practical strategies for securing acceptance from professors before learning centers or innovative teaching methods are instituted. The major point they emphasize is to avoid threatening faculty when establishing new policies or procedures. The best set of strategies for securing faculty support is advanced by Gaff as a result of his interviews with directors of programs:

> 1. Develop an outreach program. . . . 2. Start small and prove yourself. . . . 3. Keep a low profile. . . . 4. Start where the faculty are. . . . 5. Be eclectic in approach. . . . 6. Start with a small group of volunteers. . . . 7. Go with winners at the outset. . . . 8. Administer a small instructional-improvement fund (1975, pp. 123-125).

One of the major obstacles to implementing a faculty development program is economics. How does one make a case for spending funds on a faculty development center in the face of financial stringency? Crow has described some devices currently being employed to operate centers on limited budgets. These include using local faculty members as workshop leaders, trading personnel and materials with other centers, and finding inexpensive ways of operation (1976, p. 11). The view that money spent on faculty development is an investment seems quite defensible. Representative of this position is the statement by one university administrator:

> The cost of new faculty development programs may initially appear high compared to previous efforts, but given the implications of the steady-state environment, the costs of not making this investment are far greater than we may be capable of justifying (Birnbaum 1975, p. 230).

Types of Programs to Improve Faculty

Prior to 1970 there was little done in a systematic fashion to improve instruction through faculty development programs. Most of the institutional encouragement consisted of brief orientation sessions, leaves of absence, and financial assistance to attend professional meetings; however, even these forms of help were more often an encouragement to scholarship rather than an effort to improve teaching.* Of course, there continues to be the firmly held conviction on the part of many in the profession that improvement of scholarship indirectly raises the quality of teaching, for "keeping up in one's discipline" is considered the most essential requisite for a good lecture or class discussion. For instance, the philosophical basis of Central Connecticut State College's program of faculty grants is "that there is a direct and positive relationship between a faculty member's research interests and his/her effectiveness as an instructor" (Alm 1976, p. 25).

At present, approximately one-half of all colleges and universities have some type of faculty development program (Centra 1976), and some 500 have formally structured centers or institutes (Simerly 1976, p. 1). Some programs are not very extensive. Some have well-defined concepts and goals; others appear to have no clear focus. According to Martin (1975), most faculty development programs are superficial, based on an inadequate theoretical framework, and have only trivial outcomes. A few, however, are establishing outstanding reputations. Most of them are probably not as effective as they are intended to be.

One way to view them is on a continuum from one philosophical extreme to the other. At one end would be those with least impact,

*The most practical publication dealing with faculty development, its rationale, and operation is Berquist and Phillips, *A Handbook for Faculty Development* (vol. 1, 1975; vol. 2, 1977). Also very useful is the *Resource Notebook* produced by the Project on Institutional Renewal Through the Improvement of Teaching (Sally Gaff 1976). The Southern Regional Educational Board's publication, *Faculty Development Centers in Southern Universities* (Crow 1976), contains excellent brief descriptions of eleven operations in that region. The American Association of State Colleges and Universities has also produced a booklet describing a wide variety of faculty development programs at member institutions (Alm 1976). A thoughtful analysis of the potentials and problems of faculty development is contained in Smith's *Faculty Development and Evaluation in Higher Education* (1976). Centra's *Faculty Development Practices in U. S. Colleges and Universities* (1976) provides useful information on types of faculty involved in these activities.

which take a laissez-faire approach in respect to use of their services. Next would be those providing information about current teaching performance and new instructional techniques. More advanced would be those dealing with new concepts of learning theory and improving understanding of and sensitivity to students as persons. At the farthest extreme, the greatest impact would take place in those programs that reach a sizable segment of the campus community and deal ultimately with what is conceived as a sweeping transformation of the institution into a higher level of effectiveness.

Another way to classify them is by type of program format. Some are limited to short-term workshops or faculty retreats. Others take the form of continuing in-service programs that last as long as needed. Still others take the form of institutes or centers that provide a variety of services reflecting the individual needs of the faculty member. The most rapidly expanding program type is the formal center with a professional staff and a permanent range of services to offer a faculty.

Faculty development programs are found in all types of colleges and universities. They are most popular, however, in community colleges and in four-year public institutions. Medical schools also have seen the utility of establishing centers for the improvement of instruction. About 10 percent of the faculty development centers and institutes are found in independent, four-year, undergraduate colleges.

Those programs created in connection with an identifiable center have been called by a variety of names. The most frequently used are: educational development, faculty development, instructional development, and learning resource (Crow 1976, p. 4).

Self-Initiated Plans

On the most elementary level, instructional improvement can be initiated by an individual faculty member without reference to centers or formalized programs; however, it is unrealistic to expect much progress on a haphazard, unsystematic basis. According to DeBloois and Alder (1973), most faculty are not prepared for sustained self-initiated instructional improvement. Furthermore, research results indicate that most faculty seem to have a higher opinion of their teaching performance than students, colleagues, or administrators and that methods are needed to aid the self-analysis process (Centra 1972, p. 42).

Other Programs Apart from Faculty Development Centers

Some institutions limit their assistance to faculty orientation programs for new members. These programs, which probably are not

very effective in improving instruction, generally provide information about the campus and about teaching aids and ways to improve skills. Orientation programs sometimes reveal to new instructors the extent to which the institutional reward system recognizes teaching and the extent to which it is worthwhile to put high priority on teaching effectiveness.

One of the earliest stages in the evolution of faculty development was the establishment of in-service programs that provided information about a variety of subjects and in a variety of formats. In-service programs are based on the understandable conviction that it is better to improve the effectiveness of the existing faculty than to train new faculty or hope that graduate schools will give more attention to teaching matters. However, it has been suggested that one of the serious flaws of in-service training can be its onesidedness if what happens is administrators tell faculty members that they have to improve their teaching techniques. Purdy (1973, p. 55), Greene (1971, p. 201) and others recommend that a high degree of "teacher collegueship" and a large percentage of faculty involvement be sought in an in-service plan. Furthermore, as Mangano has indicated, "information alone rarely causes changes in attitudes or behaviors (1973, p. 210).

One imaginative type of in-service program is a Faculty College at the University of Wisconsin-Oshkosh, in which faculty members offer noncredit courses to their colleagues. Three types of courses are offered: those that permit faculty to learn of new development in their discipline; those that introduce them to new teaching techniques and educational trends; and those that broaden their intellectual and disciplinary interests (Birnbaum 1975, p. 229).

The faculty seminar on teaching is one of the more limited efforts to improve instruction. Usually run by one or two dedicated professors, the seminar on teaching makes available, on a voluntary basis in a course setting, materials designed to improve the individual teacher's effectiveness. The faculty seminar on teaching at Capital University has been in existence since 1971. It meets for two hours weekly for 10 weeks and devotes sessions to such topics as philosophies of education, levels of learning, teaching methods, test construction, motivation, grading methods and the characteristics of the effective teacher. In the seminar run by the Institute for the Advancement of Teaching and Learning at California State University, Northridge, participants devote a half day a week to discussion of topics of interest to them related to improving instruction (Gaff 1975b, p. 32).

Advantages of the seminar are its simplicity and its relative acceptability to faculty members. One disadvantage is its limited reach, since most seminar enrollments are small.

Small colleges sometimes take a diversified, institution-wide approach to faculty development by appointing a faculty member to supervise a variety of activities and services. A good illustration is Earlham College. A faculty member who serves as a consultant on teaching works with individual professors, small groups, and a teaching-and-learning committee to improve teaching effectiveness. This faculty committee is responsible for improving the quality of education at the college. A variety of workshops are held during the year on topics such as computer-assisted instruction, values clarification, synectics, and the use of video-taping. A newsletter is published periodically. A professional development fund provides grants of up to several thousand dollars to support various faculty projects to improve teaching.

Some consortia have established programs to assist member institutions in improving instruction. Nelson (1972) stated that some faculty feel less threatened by a service under the direction of a group of colleges rather than by their own institution. In some cases, a consortium-sponsored plan is possible where individual colleges could not afford to support one. Academic programs can be enriched through the cooperative effort that a consortium makes possible. The Colleges of Mid-America regularly grant Title III funds to faculty in the 11 member colleges to attend graduate school and hold seminars and workshops. The College Center of the Finger Lakes, which serves 4 institutions, also has an extensive faculty development program (Patterson 1974, pp. 4, 77, 140).

Institutional cooperation can take place apart from the formal consortium structure. Noonan has suggested that individuals work closely with those at neighboring colleges who are successful in innovative programs (1973, pp. 93-104).

A relatively new approach to instructional improvement is incorporated into the plan known as growth contracting. This arrangement, which is best described by Smith (1976, pp. 60-67), is a plan whereby faculty members establish goals for themselves as part of their continuing institutional relationship and meet regularly with another professional, such as a dean, to go over the contract to see how the individual has measured up to his or her own objectives. Proponents of growth contracting believe that its superiority lies in combining faculty development with evaluation. One of the most recent colleges to establish growth contracting is Gordon College.

which received a grant from the Kellogg Foundation to assist it in implementing a plan that will run through 1981. The main purpose of the project is to achieve comprehensive personal and professional growth of each participant through the operation of individual development contracts (Smith 1976, p. 62). In June 1977, Gordon College conducted a conference on faculty development through growth contracting attended by representatives from some 60 institutions (*The Chronicle of Higher Education*, May 2, 1977, p. 12). It would be premature, however, to evaluate results of the dozen or so growth contracting plans currently in operation.

The academic calendar is now in use at some institutions for faculty development. Changes in the calendar have been made at the University of Wisconsin-Oshkosh that combine the semester system with elements of 4-1-4. A 14-week term is used within a 17-week semester so that a 3-week period is free of any teaching responsibilities. During that time, faculty are encouraged to engage in activities to maintain and enhance their teaching effectiveness (Birnbaum 1975, pp. 226-230).

Some institutions prefer to bring in outside consultants to assist in upgrading instruction. A faculty committee on the improvement of teaching at Western Washington State College invites to their campus outstanding teachers from other institutions in a year-long program to speak informally on ways to improve instruction (Kelly 1973, p. 231).

A number of institutions have systematically collected books, articles, journals, and reports on the subject of teaching and related topics in higher education for use by the faculty. The *Memo to the Faculty* put out by the Center for Research on Learning and Teaching at the University of Michigan, with a circulation of over 20,000, contains articles on improving teaching. The *Journal of Personalized Instruction*, begun in 1976, features articles on a variety of research studies. *New Directions for Higher Education* is a quarterly publication that focuses on concerns of higher education, including ideas for facilitating faculty development. Many faculty development centers publish newsletters (Berquist and Phillips 1975, pp. 301-303).

Some institutions have not wanted to establish permanent centers or institutes for faculty development but instead have created ad hoc committees or groups to deal intensively with the problem for a limited period of time. Oakes College, one of the eight liberal arts colleges on the campus of the University of California, Santa Cruz, established a pedagogy task force to conduct research and distribute

its results comparing different teaching styles. The task force interviews faculty about their teaching successes and failures and conducts workshops on instruction. The college also has a position called preceptor for faculty development that is held by a senior professor who meets regularly with junior faculty members to discuss their progress and problems (Blake and Saufley 1976, p. 103).

Many colleges use faculty retreats or conferences off-campus, usually at the beginning of an academic year, to focus on aspects of instruction. Successful retreats have been conducted by St. Louis University, the University of Mississippi, the University of Illinois, and Rochester University.

A particularly imaginative variation of retreat was a two-day marathon workshop, called a Palaestric, held at a ranch some distance from the UCLA campus, which developed designs for an instructional resource laboratory. Role-playing simulation, synectics, system-analysis practices, and other group problem-solving techniques were used to get active involvement by all participants so that the final recommendations had contributions from all factions represented at the retreat.

Some institutions have tried to encourage instructional improvement by giving monetary awards for superior teaching. The Lindback Foundation awards and the annual competition sponsored by the American Chemical Society are well-known examples. In 1976 Stanford University announced that $500 salary increases would be awarded to 10 to 15 faculty members in the school of humanities and sciences in recognition of superior teaching (*The Chronicle of Higher Eduction,* May 31, 1976, p. 12). However, Eble believes that such awards are only minimally effective in raising the overall quality of undergraduate teaching (1972, p. 142).

The use of sensitivity-training groups (T-groups) in connection with organized efforts to improve instruction is beginning to be more widely accepted in academic circles. The dynamics of these groups are designed to build sensitivity and openness to others and to the way others react to an individual. They are considered by their advocates to be useful in getting persons to learn how to establish trust in others as well as how to consider and accept new ideas. It is believed that participation in sensitivity-training groups helps break down traditional resistance to change and increases the willingness to experiment (Havelock 1973a, p. 172).

Centers for Faculty Development

The most popular device for strengthening faculty and encouraging

instructional improvement is the center for faculty development. Called by different titles, the center is a permanent administrative unit, outside of the traditional academic departments, with a professional staff that conducts a variety of diagnostic and support services for faculty. The programs at these centers vary considerably. The Syracuse Center for Instructional Development works closely with departments "to help design technologies for improving instruction." Concentration is on subject matter where faculty feel most comfortable (Simerly 1976, pp. 4-5). The University of Cincinnati's Institute for Research and Training in Higher Education collects information and engages in internal consulting as well as aiding in departmental development (Sikes et al. 1974, p. 48). The Institute for the Advancement of Teaching and Learning at California State University, Northridge, seeks to establish environments for interdisciplinary study (Alm 1976, p. 10). The Center for Teaching and Learning at Stanford University also emphasizes interdisciplinary education. On the other hand, at the Teaching Laboratory at Virginia Commonwealth University, faculty members receive detailed information on their teaching from specially trained observers (Gaff 1975, pp. 31, 43). Some centers, such as those at Indiana, Michigan, Michigan State, and Brigham Young, emphasize research on teaching and produce instructional materials that are widely distributed to those interested in innovation (DeBloois and Alder 1973, p. 2).

The Clinic to Improve University Teaching at the University of Massachusetts has been praised by Berquist and Phillips (1977) for its success in faculty development. The process followed at this center is essentially "a systematic, confidential, structured exchange of ideas, perceptions and suggestions between a faculty development consultant, identified by the Clinic as a Teaching Improvement Specialist, and an individual faculty member, the purpose of which is to identify and improve teaching strengths and weaknesses." There are four stages to the service: collecting information, analyzing it, developing strategies for improvement, and consultation and further evaluation of the instructor's efforts. These authors believe that the Clinic's procedures offer "perhaps the most powerful methodology yet conceived for the actual improvement of in-class teaching" (1977, pp. 69, 78).

Another program attracting attention is the Faculty Development Resource Center on the campus of the University of Texas at Arlington. This center provides a wide variety of information services to faculty, including the distribution of journal articles. It publishes a quarterly newsletter, *Insight to Teaching Excellence*, and assists faculty

who wish to submit proposals for funding or articles for publication. A confidential personal consultation service is also offered along with a series of seminars, workshops, and off-campus retreats (Crow 1976, pp. 39-42).

A factor important to the success of any faculty development center is its staffing. Indeed, Crow believes that it is the quality and philosophical orientation of the program director that shapes the center's direction. According to her, "the director is almost always free to take the center in whatever direction he or she wishes." Furthermore, she asserts that its success depends largely on the director's understanding of the campus climate so that activities do not create a negative response (1976, p. 57). Milton, who is director of the Learning Research Center at the University of Tennessee-Knoxville, has suggested the following guidelines for establishing an institutional center: the person chosen as director should have the respect of the faculty; his or her academic discipline is relatively unimportant but the director's interest in fundamental educational issues is crucial to the center's progress; and the center should be adequately funded (1973, pp. 126-127). Unfortunately, as Gaff has observed, "there are few persons who are competent by virtue of their training and experience to help their faculty colleagues improve the quality of their teaching" (1975b, p. 151). However, their number is increasing as more centers expand and personnel associated with them gain additional experience. The Junior College Division of the NLHE has established in-service workshops to help prepare educational development officers (Roueche 1972, p. 82).

Contrary to the impression held by some, working in faculty development centers is difficult and taxing. Individual growth can be slow. The contacts developed with faculty are fragile and uncertain. Relationships must be positive. They come only after much information has been collected and, in some cases, after criticism of existing teaching styles have been expressed. The work is highly personal and individualized. The results of innovation are unpredictable. But many in the field believe that the benefits, while intangible, are nevertheless great (Diamond et al. 1975, pp. 127-132; Wergin et al. 1976, p. 300).

Interest of Professional Associations

Some professional associations have expressed a strong interest in encouraging the improvement of college and university instruction. The American Sociological Association has been active in this area (Marty 1976, p. 85). The American Political Science Association has implemented a training program for college teachers in government,

politics and public policy. Intensive, one-week courses are held in teaching methods, evaluation and learning theory (Fund for the Improvement of Postsecondary Education 1976, p. 8). The American Historical Association has a project on improving teaching and its quarterly publication, *AHA Newsletter*, regularly contains an article on the subject. In 1973, the AHA asked historians at the State University of New York at Stony Brook and three community colleges on Long Island (Farmingdale, Nassau, and Suffolk) to sponsor a pilot faculty development project (Taylor 1975). Some 200 similar projects were instituted throughout the country, and in many of them tenured professors, whose specialized courses no longer drew students, found ways to be retrained (*The Chronicle of Higher Education*, July 7, 1975, p. 3).

The American Society for Engineering Education has devoted attention to providing services and programs for members on campuses through its Educational Research and Methods division. Since 1971, representatives have presented many programs. These include a Resource Room where there are displays of educational texts, pamphlets, and educational media that faculty members can study at their own pace. This division has also held mini-Academos, patterned after the demonstrations presented at the annual ASEE conferences. According to Lovas, "demonstrations are presented in a manner that permits each faculty member to discuss in a relaxed atmosphere, on a one-to-one basis with the demonstrator, the advantages and disadvantages of the new teaching method being demonstrated" (1975, p. 431).

Sources of Financial Support

There is great variety in the amounts institutions are spending on faculty development. Obviously, the more extensive the program and the larger the staffs employed in them, the greater the cost. In 1975, the Florida community colleges set aside 3 to 5 percent of their budgets for faculty and staff development (*The Chronicle of Higher Education*, Nov. 3, 1975, p. 3). One of the smallest centers in the country, with one part-time professional staff member, operates on an annual program budget of under $10,000. At the other extreme, the annual budget for the Office of Instructional Services at the University of Florida is $900,000 (Crow 1976, pp. 20, 57).

Although the chief source of funds for instructional improvement is colleges and universities themselves, there are other sources that have been instrumental in fostering faculty development efforts. The two government agencies that have provided the largest support for

instructional improvement programs are the Fund for the Improvement of Postsecondary Education (FIPSE) in the Department of Health, Education and Welfare and the Division of College Support and the Bureau of Education Professions Development in the U.S. Office of Education. *Resources for Change*, the guide to 1976-1977 projects supported by FIPSE, describes some 35 faculty development plans.

Some state governments have taken action to support instructional improvement. In 1973-1974, the state legislature of California appropriated one million dollars to improve teaching and learning on the University of California campuses (Gaff 1975, p. 80). In 1975, the Arizona legislature set aside funds to allow faculty members to take courses, attend seminars, and conduct experiments using technological aids to improve their teaching.

Several foundations such as the Kellogg Foundation, the Lilly Endowment, the Carnegie Corporation, and the Andrew Mellon Foundation have generously supported programs designed to help faculty improve teaching effectiveness. For several years the Fund for the Advancement of Education supported research on teaching and learning in a large number of colleges and universities. In 1976, the National Institute of Education awarded Michigan State University a three-year, $3.5 million grant to establish a national institute for research on teaching (*The Chronicle of Higher Education*, April 12, 1976, p. 11).

When it comes to spending funds on faculty development, however, the colleges in the most financial trouble are the ones who most need to do more to improve instruction and are probably the ones that can least afford to do so. As financially pressed institutions cut back on expenditures, a vicious cycle occurs. Worthy experiments in instructional improvement and programs to upgrade faculty are eliminated or curtailed, thereby resulting in decreased effectiveness, decline in morale, and greater student attrition. That, in turn, reduces income further, and forces more program cuts.

Summary

An increasing number of colleges and universities are supporting faculty development programs. In recent years, particular attention has been focused on establishing and expanding carefully planned, structured centers and institutes, which should provide a wide variety of services designed to assist faculty members in their efforts to improve their teaching and to learn about new teaching methods. While

approximately one-half of all institutions are doing something in the way of encouraging faculty development, there is no guarantee that those faculty who most need to improve the quality of their teaching are benefiting from these programs. According to Centra, the most active participants in faculty development programs are those good teachers who want to improve, while on many campuses those professors needing improvement were only minimally involved (1976).

The variations among faculty development programs result from differences in philosophy, assumptions, and approach held by those who are associated with them. One popular attitude takes the view that faculty are too narrow and limited in their knowledge and experience; therefore, centers should try to increase and broaden faculty expertise. Others believe that what faculty most need is better understanding of higher education in general and of learning in particular, and that programs should be devised to meet these needs. Some programs emphasize skill development; others put a priority on getting faculty to be more aware of themselves, their own resources, and limitations. Still another group believes that what is most crucial is improved faculty awareness of students, their individualities and different learning styles (Gaff 1975a, pp. 29-30).

A comprehensive faculty development program is one that provides training in improving classroom performance, assists with professional growth within the institution, and modifies personal attitudes and values to the extent that they affect professional activity.

Examples of Innovative Instructional Methods

An encouraging variety of innovative instructional methods are currently being used in higher education. They include audio-tutorial, competency-based education, computer-assisted instruction, computer-managed instruction, and other methods. They employ instructional technology, contingency-management techniques, dial-access learning, independent study, individualized instruction, instructional television, module instruction, outdoor-survival techniques, performance contracts, personalized systems of instruction, self-paced instruction, simulation and gaming, team teaching, and videotape teaching. Before the end of the decade the list will also include videodisc instruction.

Whether all these new methods (or some of the older methods that have been modified) result in improved instruction is open to question. It is clear, however, that rapid change is occurring in the instructional field and that the use of some of these methods is increasing in popularity.

Some of these instructional techniques make use of scientific and technological developments. Some are characterized by placing more responsibility on the student in the learning process. Others are merely adaptations of time-honored pedagogical practices. Most of them have one trait in common: they are replacements for the traditional lecture method.

Lectures

Should the lecture method be abandoned? Since the overwhelming majority of professors continue to teach by means of lectures, one would hardly think so. Yet, significant numbers of highly respected authorities in the field of higher education have criticized the lecture approach and have cast doubt on its efficacy. According to Cross, "there is not much evidence that lecturing is related in important ways to student learning" (1976, p. x).

Lecturing, or what might be described as that semi-structured discourse that takes place when an instructor reads notes or speaks to a class, is faulted as a teaching method because normally the lecturer does not know his students as individuals and does not get to interact personally with them. It is preferred by those who believe that conveying content is the most important contribution a teacher can make

to learning. Yet studies done by Cameron reveal that at any given moment only about 12 percent of an audience is attentive to the lecturer (Postlethwait et al. 1972, p. 1). The lecture method is also criticized because students are not required to respond in any readily observable way (Flynn and LaFaso 1972, p. 101). Holland believes that four years of dull lectures produce in students a state of "conditioned helplessness." He thinks that youthful initiative, passion, and independence are replaced by dependence and passivity (Brown 1973, p. 60). Eble has concluded that its popularity among faculty is because "it is the easiest thing to do; it is the accepted thing to do; it is the safest" (1976, p. 42). It quickly becomes a kind of security blanket for the tired, the timid, and the traditional.

Some educators such as Brown (1973) and Engin and Engin (1977) have suggested practical ways to improve lecture techniques. There is general agreement that when used by a gifted teacher, who has something significant to say and who says it well, the lecture method can be powerfully effective. It is one technique in which the personality strengths of the instructor can be revealed in a very direct way (Buxton and Prichard 1975, p. 244). To improve his own lecturing and to increase his students' feeling of class participation, McKeachie chose a student committee to review his notes and make suggestions for improving his presentation (1969, p. 22).

As a first step to improving instruction, educators should encourage a reevaluation of the lecture method. For those faculty unalterably attached to it, emphasis can be placed on ways to improve delivery, content, and student involvement; for those who are willing to try something new, perhaps, in time, it can be abandoned.

Discussion

Discussion is a word that refers to a variety of teaching styles that require a high degree of student participation, so Socrates may have been the best discussion leader in history. While there is nothing new about the discussion method, its potential for enhancing learning appears to be great. The discussion method is a creative process by which the instructor seeks to engage the group in the act of learning by getting them to listen and speak in a sequence that is both partially controlled and also designed to maximize thinking. The discussion method is a way by which the instructor uses facts and ideas, statements and questions to advance the class's knowledge and understanding, and in which he attempts to get the discussants to contribute a portion of the material to be addressed. Effective discussion requires

good improvisation, great concentration, and infinite patience on the part of the professor. To succeed requires active participation by the student.

One of the advantages of group discussion is that the information learned by the student becomes more meaningful because he must rephrase it in his own language. Another advantage is that it is easier for a student to secure clarification of a point during a discussion than during a lecture. A third advantage is that the student has more of an opportunity to contribute to the direction the discussion takes and to test his own interpretation against that of the instructor and his fellow students (Eble 1976, pp. 54-65). A lively discussion fits the ideal of the "marketplace of ideas" that people like to associate with higher education.

According to McKeachie, one of the best features of class discussion is that it quickly reveals "the misconceptions, biases, and emotional reactions of the student. The teacher who minimizes student participation dams up one of the most useful channels of feedback" (1969, p. 230). According to Flynn and LaFaso, studies show that the discussion method produces greater changes in attitudes, beliefs, and preferences than the most passive types of educational experiences (1972, p. 103). Eble asserts that students prefer discussion to the lecture method and he attributes this preference to its contribution to the effectiveness of student learning (1976, p. 55). Although additional research is needed, it appears the discussion method is especially effective in facilitating the development of skills related to speaking, listening, and group leadership (Gage 1976, p. 213).

Of course, there are varieties of styles embraced by the term "discussion." In his fascinating book *The University Teacher as Artist* (1973), Axelrod shows how one professor's technique, orientation, and emphasis evolved radically over the years, even though he continued to teach by the discussion method.

Faculty who regularly teach by the discussion method could improve the quality of their instruction by analyzing their style, getting critiques of it, and finding ways to increase the extent and impact of student participation. Those who regularly lecture might improve instruction by trying the discussion method.

Seminars

To some people, the word seminar is synonymous with small classes. Others think of it in terms of graduate courses, research papers, advanced or specialized coursework, a small number of superior minds

sitting around bouncing ideas off of each other. Eble describes a seminar as: "a small number of intensely interested and knowing individuals letting their minds play on a common topic" (1976, p. 67).

In general, both students and faculty members prefer seminars to lecture courses. However, the seminar as an instructional technique appears to be most effective when the students enrolled in it are sufficiently knowledgeable that they can hold their own in discourse with the professor. If the seminar calls for advanced study and original research, it has good potential for exciting mature minds; but if it is the framework merely for generalized discussion, it is not likely to justify its costs.

One example of an innovative seminar approach is at Strawberry Creek College, the University of California, Berkeley. In this seminar program lower-division students are linked with research-oriented faculty members; also undergraduates are permitted in courses traditionally open only to graduate students (*The Chronicle of Higher Education*, October 15, 1974, p. 11).

Independent Study

This teaching-learning method has had wide acceptance and has been widely publicized, especially in the 1960's. The difficulty with some types of independent study is that they are more a form of dependent study and there is little saving of instructional time or effort. Ideally, independent study allows a student to be free of the limits of space and time as well as the usual prescriptions imposed by traditional instruction. According to some educators, there will be increased interest in independent study in the future (Buxton and Prichard 1975, p. 232).

The Yellow Pages of Undergraduate Innovations (Maas 1974) lists 68 independent study plans at colleges and universities. There are, of course, many more. The ones listed, however, reveal the wide range of independent study options now open to an enterprising student. Students at the University of Maine may take an entire semester of independent study. At Morningside College undergraduates may undertake a student-designed study project for one term. Oklahoma City University calls its independent study plan an "immersion semester" program (pp. 56-61).

Self-Instruction

This term is preferred by some educators over that of independent study since there is more structure and faculty involvement in it. Ainsworth defines self-instruction as "a learning experience with two

main characteristics: it must lead the student to a prespecified and testable level of competence; and it must be reproducible" (1976, p. 277). A self-instructional course is not one that runs by itself. It does not save the instructor time; what he saves by not lecturing or giving out information is offset by increased student conferences and increased testing and scoring time. But it does permit a departure from the traditional styles and schedules that shackle the usual campus.

Burlington County College has a large number of self-paced instructional arrangements. The institution has over 4,000 full-time-equivalent students, but there are only six classrooms and two large-group facilities on its main campus. All faculty members develop behavioral objectives and tests for their courses. These objectives, an outline of learning assignments and activities, and other relevant information are given to students in a "learning packet" at the beginning of the semester. When new faculty are hired, the expectations about instruction inherent to this approach are made clear.

At Governors State, faculty are given a reduced teaching load so that they may have more time for self-instructional course preparation. Ainsworth, who has identified the major obstacles to its wider use, believes that self-instruction will flourish as a viable alternative to the lecture method only when administrations provide adequate financial and logistical support for monitoring, testing, and counseling the student (1976, pp. 275, 287).

Instructional Technology

Instructional technology usually refers to those electronic and mechanical devices that assist the instructor, such as computer-assisted instruction, computer-managed instruction, computer simulation, remote classroom broadcasting and response, student-initiated access to audio or visual recordings, television, motion pictures, and even slides and tape recorders. There is a second definition that goes beyond any particular teaching technique, however, one which was popularized by Tickton and others. It is a "systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and human communication, and employing a combination of human and nonhuman resources to bring about more effective instruction" (1970, p. 21). Technology may thus refer to devices or procedures or both, but generally it applies to the use of electronic and mechanical equipment. In weighing the current and future role of instructional technology, it is well to bear in mind Ashby's ob-

servation that "the art of teaching is one of the last of the useful arts to become technological . . . . (technologies) are not just the application of science to social needs; they are expressions of humanism" (1974, p. 41).

Its proponents see a bright future for instructional technology. The Commission on Instructional Technology, which has produced comprehensive documentation on its potential, has asserted that instructional technology has the means for extending the scope and power of instruction It allows for a far more productive use of both instructors' and students' time. It expands the capability of instructors by relieving them of the need to spend excessive time on elementary and routine tasks. It reduces the burden of some administrative duties, thus freeing faculty for more attention to substantive course preparation and to meeting with students individually and in small groups. It increases the opportunities for independent study. It speeds the rate of learning and increases the student's opportunities for learning in a variety of ways: by storing information until it is needed, distributing it over distances, presenting it to students in different modes, and providing the opportunity to react and respond to the material in many ways (Tickton 1970, pp. 10, 31-32, 35; Carnegie Commission on Higher Education 1972, pp. 65, 83-85). Brubacher has concluded that "Educational technology, with its recordings, tapes, copying machines, films and television, seems increasingly able to carry the burden of didactics . . . . [but] there will always be room for heuristic lessons; and certainly educational technology can never replace philetic instruction [mutual affection between teacher and pupil] (1977, pp. 87-88).

There are drawbacks to instructional technology. According to Boulding, "it tends to concentrate on specific and particular performance and behavior and by its very nature cannot be concerned with the total development of the individual" (Morris 1970, p. 111). To some educators, its preoccupation with numbers and quantity connotes a slighting of quality (Hoos 1975, p. 141). Some computer programs have been poor. Some equipment has been inadequate. Its development and use have been more costly than anticipated (Carnegie Commission on Higher Education 1972, p. 1; Harrison and Stolurow 1975, p. 163).

There are other reasons why its effectiveness has been limited: teachers have not been adequately trained in its use; in some cases, amateurs have experimented wastefully with it (Johnston 1975, p. 485); on a number of campuses there is strong faculty apathy, indif-

ference, skepticism and hostility; and some view it as a threat to them (Carnegie Commission on Higher Education 1972, p. 24).

Harrison and Stolurow indicate that for educational technologies to be really effective, "an institution must have a well-defined sense of purpose, dedication and commitment" (1975, p. vi). Nevertheless, even though the long-range estimates are that they will yield good dividends, there remains for many persons a limit to their role in higher education: "Regardless of the incredible speed of the computer or the impeccable logic of a teaching machine, nothing as yet envisioned in even the most fertile mind can out-weigh the essential value of the gifted teacher appearing in person" (Bornheimer et al. 1973, p. 19).

The following examples illustrate the wide variety of contexts in which instructional technology is currently being applied. Brigham Young University, in cooperation with the Mitre Corporation and the University of Texas, has developed TICCIT (the Time-shared Interactive Computer-Controlled Information Television), which combines conventional television, cable technologies, and microcomputers. PLATO, the Programmed Logic for Automated Teaching Operation, housed at the University of Illinois, is a control computer facility simultaneously serving many remote users of terminals, with responses in fractions of a second. Subject areas currently being taught include Russian, French, Latin, physics, biology, political science, veterinary medicine, economics, accounting, music, and engineering (Harrison and Stolurow 1975, pp. 91, 112). TICCIT and PLATO use different hardware, software, and courseware: TICCIT is designed to operate with terminals in a learning resource center; PLATO operates through a network with terminals distributed widely and linked by means of telephone lines (Gage 1976, pp. 70-77).

Black Hawk College at Moline, Illinois has developed an educational delivery system designed to accommodate adults who are employed full-time or who have full-time home responsibilities. One version uses printed materials plus audio-cassette lectures by the college faculty. Students can take examinations either on campus or at their neighborhood public library on the coursework they have studied on their own. (AGB *News Notes*, March 1977, p. 3).

Computer-Assisted Instruction (CAI)

The potential for computer-assisted instruction appears to be extremely great. When it is used to interact with students as they proceed through a self-paced course or program, it can provide instant response and thus simultaneously enhance learning and stimulate

motivation. Its speed, accuracy, and memory-storage capacity are far beyond those of a human teacher. Cost is a deterrent to its wider use, but even the cost is being reduced. If its use enables instructors to be more productive with their time, the CAI should be considered. It is known that its use does reduce the time for learning a given unit of information.

The Yellow Pages of Undergraduate Innovations lists some 77 institutions using computer-related procedures in instruction (1974, pp. 46-55). A few historians are currently using computer technology in their courses to teach subjects such as the nature of voting behavior, the changing pattern of family structure, and urbanization trends (*The Chronicle of Higher Education*, April 28, 1975, p. 3).

There is a philosophical question related to CAI some educators have raised. Proponents of it tend to emphasize the role of education as that of conveying content. Critics of CAI look upon education more as a process and as interaction between human beings rather than between a human and a machine. For whatever reason, CAI is still found in a minority of institutions. In Cross's 1974 survey CAI was used in only 16 percent of community colleges (1976, p. 61).

Computer Managed Instruction (CMI)

In CMI, the computer is used to manage individualization of instruction through diagnostic testing and prescribing assignments based on individual performance levels and needs. However, the student interaction possible in CAI does not exist. The CMI system at Miami-Dade Community College in Florida is called Response System with Variable Prescriptions (RSVP). Both on- and off-campus students are served by the computer, which scores tests, diagnoses learning problems, gives assignments, and reports results. The individualization of the process is extensive and even includes the processing of individualized letters to students (Cross 1976, p. 70).

At the University of Rhode Island, a computer-management system called TIPS (Teaching Information Processing System) monitors individual and class performance, diagnoses student strengths and weaknesses, and provides individualized assignments for students who have different performance levels. TIPS forces the instructor to clarify what he wants the student to learn. Research results have been encouraging. The students for whom TIPS was available scored, on the average, about 11 percentage points higher on the final examination than did students who had not had the opportunity to use this system (Basser and Allen 1977, pp. 151-154).

Programmed Instruction

Programmed instruction was widely praised a decade ago, but in the 1970's it apparently has not lived up to expectations. Programmed instruction is the term used to describe course materials that students work through on their own. Its potential for improving instruction is limited to certain fields and types of learning. Normally, it consists of a series of steps, or frames, that are carefully arranged to lead the student toward the desired end. Test questions are inserted in the materials and the results of these tests give the student the immediate response and reinforcement considered necessary to ensure proper learning. According to Bunderson and Faust, programmed instruction is "instruction that results from a systematic development process in which the developer assumes the responsibility for student learning" (in Gage 1976, p. 46).

The main attraction of programmed instruction is the opportunity it affords to "accommodate instruction to individual differences" (Eble 1976, p. 76). Masses of material can be sorted and laid out in sequences that enable a student to master a subject.

Its major disadvantage is thought by many to be that it encourages rote learning and forces student conformity to those responses in agreement with the program. It also seems not to motivate students. The time and cost involved in producing programmed instructional materials are other deterrents to its wide acceptance. Nevertheless, its existence contributes to the development of more recent nontraditional instructional methods.

Television Instruction

Teaching by television is one of the better known instructional technologies. On some campuses, teaching by television is a device to enable a lecturer to be seen by more students than a particular classroom can hold; also its use permits an instructor to illustrate his presentation in effective visual ways. Its major utility is in making it feasible for persons to take courses without being on a college campus.

Instruction by television is not necessarily a time-saver for faculty. One study undertaken at Miami University revealed that instructors preparing for television instruction spent from three to six times as much time preparing for an hour of TV instruction than they spent preparing for a conventional lecture (Carnegie Commission on Higher Education 1972, p. 66).

One of the longest and most successful programs is Chicago's TV

College, an extension of the two-year City Colleges of Chicago. It has been in operation since 1957 and since that time over 150,000 individuals have enrolled in televised courses. Of this number, some 80,000 enrolled for credit and approximately 2,150 of the students who have graduated from the City Colleges of Chicago took one semester of their work by TV. The TV College broadcasts an average of 25 hours a week. According to one study, the average cost-per-credit-hour of instruction is slightly lower than that of conventional instruction (Harrison and Stolurow 1975, pp. 171-180).

With a grant from the Fund for the Improvement of Postsecondary Education, public television station WNET/13 in New York is designing a new educational system to serve adult learners in its viewing area. Plans call for the development of programs of study that will offer students an opportunity to earn an AA or AS degree from one of the participating colleges by taking approximately one-third of their coursework by television. In addition, a consortium of 15 colleges in the New York, New Jersey and, Connecticut areas (with the cooperation of corporations, labor unions, and community organizations) will design courses that will respond to the particular educational needs of the viewing audience (Fund for the Improvement of Postsecondary Education 1976, p. 43).

Multi-Media Instruction

This approach involves the use of a variety of technological devices such as films, tapes, film-strips, programmed workbooks, and the like. The St. Louis Junior College District has had success with multi-media instruction in English, chemistry, and psychology at one of its campuses. Early evaluation of it as a teaching device revealed significant increase in student achievement and a decrease in dropout rates. Junior college instructors seem to have taken the lead in using multi-media methods (Travers 1973, p. 1026).

Videotape and Videodisc

One extension of televised instruction is instruction by videotape. Videotapes, like audiotapes, enable the learner to time the instruction to meet his needs rather than having to accommodate to the time constraints of the teacher or the television station. Colorado State University is making use of videotape instruction in its graduate engineering courses, which means that students can study at their places of work instead of on campus (Harrison and Stolurow 1975, p. 181).

The latest innovation (not yet in operation for instructional pur-

poses but currently under development) is the videodisc. The videodisc, which looks much like a phonograph record, is being experimented with for educational use by MCA Disco-Vision and the Consortium of Universities of the Washington Metropolitan Area. The major advantage of videodisc over television is that the viewer can select his own time to watch a lesson; another advantage is that the videodisc can be stopped so that the viewer can examine a single picture frame, can slow the motion, reverse it, or speed it up. In time it should be possible for students to receive a degree as a result of study by videodisc and coursework at one of the colleges in the consortium (*The Chronicle of Higher Education,* April 11, 1977, pp. 4-5).

With respect to all methods embraced by the term instructional technology, to be effective they must be used by persons qualified to employ them. Designing, planning, and evaluating courses taught by these methods must be systematic. Instructional technology should be used to extend, not restrict flexibility. It must help students learn, not merely entertain them or occupy their attention. The Carnegie Commission on Higher Education advanced the following criteria to use in deciding whether or not to employ instructional technology:

> The teaching-learning task to be performed should be essential to the course of instruction to which it is applied.
>
> The task to be performed could not be performed as well—if at all—for the students served without the technology contemplated (1972, p. 11).

Contract Learning

Over 300 colleges and universities are currently using learning contracts in their curricula (Berte 1975, p. 3). A learning contract is a document drawn up by a student in consultation with an instructor, a mentor, or a committee that spells out what the student will learn in a given period of time. There are two types: in one type, the objectives are set by the student with the activities, time, and evaluation criteria drawn up through negotiations between student and instructor; in the other type, the student does all the defining of objectives and terms. Essential to the concept of contract learning is the making of a commitment or a bargain to accomplish a particular objective. The instructor accommodates himself to the particular directions and resources the student needs and the student accommodates himself to complete the stated learning activities (Keeton 1976, pp. 93-94). Starr believes its strength lies in the fact that it is based on the premise that the instructor so creates the proper learning environment that the student receives the desired reward following completion of the agreed-upon task (Johnston 1975, p. 187).

Some professors who have participated in contract learning arrangements assert that the teacher's time spent per student is substantially greater than in the classroom method (Barlow 1974, p. 441). But proponents believe that it is time well spent. Among the advantages cited are: (1) it is more responsive to the great diversity of students' abilities, learning rates, and backgrounds; (2) it has greater flexibility for the autonomous type of student, the well-motivated, the working student, the older student; (3) it takes advantage of the fact that persons learn best what they want to learn; (4) it encourages students to focus on fundamental intellectual pursuits rather than on gathering information (Lindquist 1975, p. 76).

Critics of contract learning have pointed out that large numbers of traditional students are not ready for the freedom and flexibility it brings. Romine has cautioned institutions to determine student readiness for it before instituting contract learning. He also has cited McKeachie's research results that indicated that students taught by independent study do not always develop greater ability nor do they become interested in learning independently (1974, p. 422).

Lindquist has suggested several strategies for those wishing to implement contract learning. He recommends that broad support be secured from "a core of persistent advocates," that adequate funding be secured for its operation, and that its direction be guided by those who "understand the program, are committed to its objectives and methods, and have appropriate background for advising, tutoring, coordinating, collaborative evaluating, and learning the resource-linkage skills they need" (1975, pp. 88-89).

The contract approach is used throughout the entire degree program at Wilmington College and at the University of South Carolina. Contracts are developed every few months at Empire State College and they cover a wide variety of learning experiences, most frequently independent study. Most contract learning arrangements, however, are in traditional departmental courses. It would be misleading to think of contract learning as a novelty. It had its predecessor in the Dalton Plan (Johnston 1975, p. 187).

Experiential Learning

Experiential learning as an instructional method is certainly not new, but the 1970's have witnessed a remarkable growth in its popularity. The term refers to learning that takes place outside the classroom in the context of living experience rather than only through study. According to Chickering, it is "the learning that occurs when changes in judgments, feelings, knowledge, or skills result for a par-

ticular person from living through an event or events" (Keeton 1976, p. 63).

The defense of experiential learning as a preferred type of educational experience is based on an important concept worth considering in detail. Coleman has found it a felicitous way to contrast the learning steps in experiential learning with those in the traditional instructional approach:

> The information assimilation process, the one by which much of academic learning takes place, occurs through a series of steps. The first step is receiving information. . . . The second step is assimilating, and organizing information so that the general principle is understood. . . . The third step is being able to infer a particular application from the general principle. . . . The last step is moving from the cognitive and symbol-processing sphere to the sphere of action. . . . The experiential learning process proceeds in almost a reverse sequence. . . . In the first step, one carries out an action in a particular instance and sees the effect of that action. . . . The second step is understanding these effects in a particular instance, so that if exactly the same set of circumstances reappeared, one could anticipate what would follow from the action. . . . The third step is understanding the general principle under which the particular instance falls . . . . the last step is its application through action in a new circumstance within the range of specialization (Keeton 1976, pp. 50-52).

The advocates of experiential learning base part of their rationale on the conviction that traditional educational practices do not fulfill students' needs and inadequately represent our understanding of knowledge. They maintain that knowledge without experiential content is incomplete. Furthermore, there is the belief that some areas of knowledge are better approached by way of experiential learning and that there are some types of students who respond more affirmatively to this mode than to traditional pedagogical styles. This type of learning, it is maintained, permits students to live through various work settings, thereby increasing interpersonal and professional competence (Keeton 1976, pp. 2, 40, 83).

For some educators, experiential learning holds an added attraction. According to Rogers, experiential learning enables "a quality of personal involvement—the whole person in both his feeling and cognitive aspects being in the learning event. It is self-initiated. . . . It is pervasive. It makes a difference in the behavior, the attitudes, perhaps even the personality of the learner" (Sikes et al. 1974, pp. 27-28).

One example of how experiential learning is employed at the undergraduate level is found at West Virginia University. There the Department of Chemical Engineering, with a grant from the Exxon Education Foundation, created PRIDE (Professional Reasoning Integrated with Design Experience). In this approach, students attack

problems rather than masses of information and apply what they learn in practical situations (Bailie and Wales 1975, pp. 398-402). New College in Saratoga, Florida combines off-campus study with experiential learning (Brown 1973, p. 224). Some institutions, such as Appalachian State University, give academic credit for participation in Outward Bound. At present, there are over 200 innovative outdoor educational programs in the United States that reflect some element of the Outward Bound spirit (Cole 1976, p. 608).

Module Instruction

A module has been defined as "a self-contained, independent unit of a planned series of learning activities designed to help students accomplish certain well-defined objectives" (Goldschmid and Goldschmid 1973, p. 16). Module instruction (MI) allows a student to proceed at his own rate and to select his own preferred mode of learning. Well-defined objectives are usually associated with module instruction. Some educators consider it one of the most promising instructional alternatives.

The University of Lowell, with a grant from the National Science Foundation, has embarked on an effort to strengthen teaching techniques in mathematics and engineering by eliminating the traditional three-a-week lectures and dividing course-work into some 30 self-contained units, with a mini-examination following each unit. Students go at their own pace through the modules and their strengths and weaknesses are quickly identified (*Boston Herald-American,* January 4, 1977).

Probably the most sweeping use of module instruction is found in College IV of the Grand Valley State Colleges. At this institution, several thousand learning packages called modules are available for student study. Each module is equivalent to about one-tenth of a standard course in terms of content. Each module carries its own academic credit. Approximately one-half of the four-year course of study is by module instruction; the other half is by contract learning, either in independent study or in small group problem-centered projects. Students may start their study at any time during the year and at any point in the cluster of modules (Johnston 1975, p. 395).

According to Cross's 1974 survey, approximately three-quarters of all community colleges were using some sort of self-paced learning modules (1976, p. 75).

Audio-Tutorial System

One modular approach that has attracted considerable attention is

the audio-tutorial system. Founded by Postlethwait at Purdue, this system is "a multi-faceted, multi-sensory approach" (1972, p. 7) by which the student seeks to meet the stated objectives of a course by following taped instructions recorded by a master teacher. The program of learning is so organized that students proceed at their own pace and are able to bypass those portions of the subject matter they already know. They follow the instructions on their tape, stopping when necessary to read, view films, fill in charts or diagrams, use microscopes, conduct experiments or consult with the instructor. The nature and sequence of the teaching aids employed depend on the nature of the subject matter being studied. Basically, however, AT combines tape with printed materials, visual ones and tangible ones, and direct human interaction.

There are three basic study sessions connected with AT: an independent study session, a general assembly session, and a small assembly session. The student can interrupt the sequence of planned activity at any time to ask for consultation. The learning events are well structured. Although the student controls the rate at which he proceeds, the route he follows is carefully planned in advance and his or her sequence of study activities represents a total immersion in the subject encountered. The teaching atmosphere is relaxed and comfortable. According to its founder, personal contact between instructor and student is not reduced by the use of the audio-tutorial system but is increased, and the contact is more direct and more informal. Apparently, the total number of instructors used in AT is about the same as the number required in traditional classes (Postlethwait 1972, pp. 21, 68). Recently, Postlethwait added to the audio-tutorial approach a system of mini-courses, subdivisions of the traditional semester-long course, which adds extra flexibility to the arrangement.

This learning system employs individualization and flexibility in a fascinating fashion. Some of the anonymity and impersonality of the large lecture class is replaced. Although there has been insufficient definitive research on its effects, according to Cross, there seem to be encouraging indications that students learn as well or even better in AT courses than in conventional classes (1976, p. 89).

Personalized Self-Instruction

Personalized self-instruction (PSI), or the Keller Plan is probably the most rapidly expanding instructional innovation at the present time. Basically, it is a system that allows a student to learn material, and be tested on it, at his own speed. PSI, which has been called the

"fifth revolution" in education by Ruskin (1974, pp. 1-2),[1] has five major characteristics:

1. It places emphasis on the written word for the most effective communication between instructor and student.

2. It uses the unit perfection requirement, which means that the student must master one segment or unit, before going to the next.

3. It permits students to pace themselves, proceeding through the course as quickly or as slowly as they wish.

4. Lectures and demonstrations, which normally students are not required to attend, are used to increase motivation rather than as means for conveying critical information.

5. Superior students in the course are used as proctors to assist the rest of the class in a variety of ways.

Although the self-pacing feature of PSI has received enormous attention, some educators believe that its most significant feature is the reliance on students as peer tutors or proctors, for their role in this instructional technique is unique and gives PSI a truly personalized aura (Ruskin 1974, pp. 13-14).

Unlike some other instructional innovations, PSI is based on a learning-reinforcement theory. Its basic element is Thorndike's law of effect, which, in brief, states that responses that are followed promptly by reinforcement increase in frequency (Sherman 1974, p. vii).

Courses that are most frequently taught by PSI are in psychology and physics, followed by engineering, mathematics, statistics, chemistry, and biology. PSI is used less frequently in astronomy, Spanish, library science, and philosophy (the latter at Boston University). Northeastern University uses a variation of PSI in its music course. According to one study, in 1972 there were approximately 875 PSI courses in psychology (Cross 1976, p. 93). By 1976, at least 100 institutions were offering about 2,000 PSI courses each semester (*The New York Times*, May 1, 1977). Economics is a field recently opened to PSI. In 1970 no college economics courses were taught by this method; in 1975 there were PSI economics courses at over 80 institutions (Allison 1975, p. 5).

One reason for the spread of PSI and for its popularity among innovation-minded instructors is the extensive publicity this instruc-

[1] According to Ashby, the first four revolutions in education were the professionalization of teaching, the adoption of the written word as tool, the invention of printing, and the adoption of new technologies in the twentieth century (1974, p. 34).

tional method has received. There is now a Center for Personalized Instruction at Georgetown University that serves as a clearinghouse for institutions. A newsletter is published and an annual conference is held for the dissemination and discussion of scholarly papers on the subject. Another reason for its popularity could be the fervor with which its advocates speak and write.

Many advantages are cited for using the PSI method. An increasing number of educators assert that it results in improved student performance, better retention of material for longer periods of time, and more positive student attitudes toward the subject studied. Indeed, many reports speak of student enthusiasm for taking courses by the PSI method. Another advantage is the increased flexibility allowed students in determining when to study and in permitting above-average students to move ahead at a faster rate than permitted them in traditional courses. Another characteristic of this approach that many believe is an attractive feature is that one faculty member can teach one hundred or so students with more face-to-face discussion and conference contact than is possible in a traditional lecture setting (Johnston 1975, pp. 74, 80, 85, 123). Its relatively low cost also is considered a plus.

There appear to be a few disadvantages: certain students cannot work adequately in this type of learning environment; in some PSI courses, there is a larger dropout rate than in traditional courses; the less able students appear to profit least from PSI instruction; poorly motivated students and those who like to procrastinate are not as enchanted with this method (Johnston 1975, pp. 382-383).

Some faculty shy away from PSI because of the initial challenge and time required to implement it. Tiltenberg found in teaching intermediate microeconomics using PSI that the total time required to establish a course was 1½ times as much as the time required to set up a lecture course for the first time (Johnston 1975, p. 87).

Some educators fault PSI for two unrelated philosophical reasons: some object to the notion that theoretically all students enrolled in a course can achieve a grade of A; others object to the emphasis on mastery of subject matter on the grounds that that objective is not or should not be the ultimate goal of all education (Cross 1976, p. 107). Still others question whether PSI in a course or two has sufficient impact when the rest of the student's educational experiences lie within a traditional fracework. Combs believes that "drastic institutional change must occur before individualized, self-paced instruction is considered a realistic alternative" (1975, p. 407).

Nevertheless, a consensus appears to be emerging that this method can make a valuable contribution to the improvement of instruction, that its advantages far outweigh its defects, and that this system of teaching is satisfying to both instructors and students. Some would say that it is even exciting. (For a summary of recent research on the effectiveness of PSI, see "Research on PSI" in the next chapter.)

One of the most sweeping moves to PSI has occurred at the University of Texas at Austin. Supported by a $340,000 grant from the Alfred P. Sloan Foundation, that institution undertook a two-year program to develop or redesign 12 PSI courses and to institute systematic evaluation of them (Harrison and Stolurow 1975, p. 117).

Other Methods

Mastery Learning — Mastery learning is a term receiving increased use and attention. Sometimes it is associated with PSI, since one of the basic characteristics of personalized student instruction is that the student masters one portion of the course before moving to a more advanced portion. However, mastery learning can be used apart from PSI.

Mastery learning is based on assumptions developed by Bloom and Carroll, who advanced the notion that aptitude is really only the amount of time a person needs to attain mastery of a particular task, skill, or idea (Roueche 1972, pp. 14-21). According to this theory, students do not fail. Some just take longer to conquer material than others. Mastery learning takes the competition and elitism out of the approach to education. Its weakness is that despite all the time in the world, some students just never master calculus, comprehend Hegel, or handle knowledgeably Einstein's theory of relativity. However, Cross sees mastery learning as "the critical missing link in the eduaction of low achievers." She believes that its value lies in laying a foundation for future learning by getting students to comprehend one unit before proceeding to more challenging material and by demonstrating to poor students "that they are capable of doing good work" (1976, p. 78).

Team teaching — For many years institutions have been employing varieties of team teaching to enhance instruction. The basic form of team teaching is simply an arrangement by which two or more persons cooperatively and simultaneously plan a course, teach it together, and evaluate a group of students so that the strengths of each member of the team are used most effectively (Brown 1973, p. 256).

Its advantages lie in the combining of several talents as well as in

the greater variety possible in the approaches to a particular subject. The extra cost of this style of teaching is considered its main disadvantage. However, there are ways to circumvent the cost factor and on campuses with declining enrollments and underutilized faculty, team teaching might be tried as an alternative to the traditional one-person lecture class.

The Massachusetts Institute of Technology has a program called "Concourse," which is a team-teaching program that involves collaboration across disciplines. Sweet Briar College employs team teaching plus community experience in an environmental studies program (Maas 1974, pp. 90-91).

The effectiveness of team teaching has led some educators to explore the approach of team learning: groups of students moving through a course together in a cooperative fashion, helping each other and gaining from a variety of perspectives. Such an approach is based on the philosophy that the competitive aspects in the educational process should be eliminated and that individual growth is augmented through group cooperation. Team learning as an educational reform may be too idealistic for pre-medical and pre-law students, whose concern for admission to professional school may outweigh their love for learning.

Off-campus learning — Sometimes, as Eble has put it, "classes and classrooms do get in the way of learning" (1976, p. 28). During the last five years there has been more of a willingness on the part of faculties to approve educational arrangements that take students off-campus. The success of the University Without Walls experiment has contributed to reducing traditional resistance to off-campus study. A wide variety of programs are currently being tried: instruction in factories and prisons, internships with community service agencies, projects in zoological research centers, and cooperative programs with labor unions. Students are attracted to off-campus programs partly because the experience assists them in making career decisions. Many off-campus arrangements involve the requirement of written reports or oral presentations so that there can be an evaluation of the off-campus learning experience. In 1976-77, the Fund for the Improvement of Postsecondary Education (FIPSE) supported 23 projects involving off-campus learning. *The Yellow Pages of Undergraduate Innovations* (Maas 1974) contains 192 off-campus educational programs.

Encounter groups — The encounter group generally is thought of as a form of therapy or as a radical means of raising one's con-

sciousness in respect to oneself or others. Its use in courses in higher education is minimal. Most faculty seem to be suspicious of its effects and side-effects. Yet, Carl Rogers has maintained that it is one of the most rapidly spreading innovations of the twentieth century, and he thinks that it has great potential for improving instruction. Houston Smith, professor of philosophy at MIT, has taught philosophy courses that combined encounter group techniques with traditional cognitive learning modes and lived to write about it. The encounter group is experimental in approach, nonauthoritarian in atmosphere, very personal, and involving and activating in its impact on participants (Buxton and Prichard 1975, p. 215). It probably deserves more careful study than it has had.

Information retrieval — Libraries have long been looked on as valuable adjuncts to the teaching process. The library is to the humanities and social sciences what the laboratory is to the sciences. Although there seems to be no disputing the assertion that instruction can be improved by more effective use of library resources, much still needs to be done on many campuses to achieve optimum integration of libraries or learning resource centers into the instructional program. According to the Carnegie Commission on Higher Education, libraries have been "inadequately utilized in the instructional efforts of colleges and universities (1972, p. 33).

One example of an effective information retrieval set-up is the Remote Access Instructional Learning System (RAILS). This system makes a large number of stored and live audio and visual educational materials available to faculty and students for individual and class use (Goldschmid and Goldschmid 1974, p. 5).

Integrated approach — One innovation that may seem impractical at first but which merits more serious consideration is one that can be called the "integrated" approach. In the Coordinated Studies program at Evergreen State College, the student spends up to 32 hours a week with faculty members and uses a variety of routes to learning: discussions, lectures, films, reading, field trips, special research, etc. This variety of educational experiences, however, is viewed as coherent rather than peripheral or conflicting (Milton 1973, pp. 91-92). Obviously, compared to the traditional methods, such an arrangement places a different teaching expectation on the faculty member.

Simulation and gaming — The use of games and simulation devices is increasing in popularity. For many years they have been used by the armed services to teach military strategy and to train persons in the use of complex electronic equipment (Tickton 1970, p. 76). Simula-

tions are exercises involving the abstracting of certain elements of a model to approximate a social or physical reality in such a way that the student can interact with and become part of that which is being simulated. Some simulation games are computerized, while others can be played without technological aids.

Because they are entertaining, simulations and gaming are considered useful in motivating students because they give immediate feedback and provide experiences that promote social and emotional growth (Maas 1974, p. 14).

Zuckerman and Horn's *The Guide to Simulation/Games for Education and Training* (1973) contains information on over 600 games and simulation approaches. Examples recommended for their potential in adding zest to instruction are the Teacher-Student Interaction Game, Responding to Student Stimuli, and Teaching Strategy (pp. 182-183).

Four instructional games are employed in an engineering course on environment systems for nonengineering majors at Michigan State University. Research has revealed that computer-based instructional games with a technological orientation increase student motivation and provide a better appreciation of the interactions between technological processes and society. Student attitudes have been positive and learning results have exceeded expectations (Committee on Instructional Cooperation 1976, p. 14).

Research on Improving Instruction

During the 1970's systematic, definitive research on improving instruction has lagged for a number of reasons. Some scholars were discouraged from undertaking studies on this subject because of the inconclusive results of earlier research. It did not seem to matter very much what teaching method was used. The mood toward research on teaching styles was partially set by the findings of Duben and Taveggia in their book *The Teaching-Learning Paradox: A Comparative Analysis of College Teaching Methods* (1968). As a result of careful examination of data on comparative college teaching methods they came to the following conclusion: "we are able to state decisively that no particular method of college instruction is measurably to be preferred over another, when evaluated by student examination performances" (p. 10).

This interpretation was echoed by others. Travers stated, "in general, recent studies of teaching methods and materials, like their predecessors, yielded no clear-cut evidence of the superiority of any open approach" (1973, p. 1056). Romine also commented on the inconclusive, contradictory, and discouraging results of research on teaching methods (1974a, p. 415). These observations encouraged some to defend their own instructional techniques and others to defend the status quo, since there seemed to be no overwhelming evidence to encourage change. Now, as a result of recent research, the time has come to revise these earlier interpretations.

The state of instructional research in the 1970's has not received the attention it deserved because more pressing matters of institutional concern have overshadowed interest in the improvement of teaching. Leveling of enrollments, the financial crisis facing many colleges and universities, the impact of inflation on higher education, governance issues, faculty unionization, the relationship between government and postsecondary institutions, the implementation of affirmative action — these and other questions have seemed to attract more scholarly attention than extensive research on ways and means to improve instruction. These issues and the great concern over the future of higher education and the survival of individual colleges have seemed to divert attention from interest in innovation, especially regarding teaching methods. When the ship appears to be about to sink, one does not feel like studying the merits of one pump over the other: you use them all and hope for the best.

The State of Current Research

While national interest in this subject may have been inadequate, there has not been a lack of research on individual campuses. Hundreds of articles have been written about separate surveys, questionnaires, and reviews of different instructional methods. The very existence of this corpus reveals an important characteristic about research on instruction: most of it is limited to a particular method or course or department or institution; most of it is short-term and the universe studied is too small to allow application of the results to larger segments of the student population; some of it suffers from "serious methodological flaws" (Ruskin 1974a, p. 32); most of it is written by those who, in some way, are directly involved in the teaching or administering of what they are studying; and most of it is so poorly and narrowly written, and published in specialized professional journals, that their readership is regrettably small.

More careful study, more rigorous analysis, and more comprehensive and sophisticated review of innovations in instruction are needed (Travers 1973, p. 1024). As Bonham observed, "we remain in the Stone Age in terms of the effective assessment of innovative departures in higher learning, and we shall have to await some better mechanisms before such a national evaluation can be attempted" (Maas 1974, p. 7).

Research on instructional effectiveness may have one element that will always limit the universality of its findings: no matter how objective the researcher is, no matter how careful his methodology, human variables will influence the results. McKeachie was aware of this when he wrote, "we seldom know how well a particular method was used in experimental studies of teaching methods, but it seems very likely that the effectiveness of a method depends upon the competence and enthusiasm of the teacher" (1969, p. 236).

There are other problems with research in this area. Cross has stated that studies on teaching effectiveness are disappointing because the wrong questions are asked (1976, p. 111). Wilson has pointed out that a term such as "effective" is a value word, a social judgment rather than a description; consequently it is difficult to get agreement about the what and the how of measurement (Brown 1973, p. 282). It is very difficult to control the important variables. Domino has suggested that what researchers lack is the awareness that different methods may have varying effectiveness for different types of students, so that the focus should be on fitting the style to the student and not expecting all students to "march to the same drummer."

despite what research proves about that particular drum (1975, pp. 8-11).

While there are problems with methodology, while it is difficult to acquire accurate data on humans participating in something as personal as the teaching-learning relationship (who may themselves be influenced by the research design), while performance criteria are limited gauges of student learning, and while it is difficult to generalize on the basis of small surveys, the most serious criticism leveled against some recent researchers is that they display too much zeal in arguing their interpretations of the data they collect and in making categorical statements that seem to go beyond the boundaries of available evidence. Some research reports have a missionary flavor about them that exceeds mere scholarly enthusiasm. Woodarski and Buckhold (in Johnston) have listed the major methodological pitfalls that characterize much of the research on instructional methods:

> (1) An adequate control group is not used; (2) no serious attempt is made to isolate the effects of each of the several components comprising the research model; (3) there is insufficient attention to the role of course content in shaping results; (4) there is insufficient attention to the variables of student response; (5) the particular study undertaken cannot easily be replicated; (6) there is insufficient regard for the ethical considerations connected with the research being conducted (Johnston 1975, p. 453).

Despite these criticisms of recent research, it is important to keep in mind that there have been some significant findings about instructional methods that deserve to be more widely read. The most recent research studies are reported in *The Psychology of Teaching Methods* (1976) edited by Gage, the *Second Handbook of Research on Teaching* (1973) edited by Travers, and *Behavior Research and Technology in Higher Education* (1975) edited by Johnston. The *Journal of Higher Education*, the *Journal of Educational Research*, and the *Journal of Personalized Instruction* also regularly contain useful articles on current research findings.

Examples of Relevant Studies

The following summaries of relevant research illustrate the wide scope of recent publications on this subject. The surveys that Gaff has conducted and reviewed reveal that smaller, teaching-oriented institutions (in contrast to larger, research-oriented ones) are more likely to encourage those faculty behaviors and interests that facilitate a more effective educational experience for students. He has reported that, "evidence from students confirms that learning experiences differ

in smaller teaching institutions than in the larger, research-oriented university" (1973, p. 618). However, while smallness rather than impersonal bigness would seem to lead to more effective teaching, a number of observers have indicated that intimacy is no justification for mediocrity. A small class is not necessarily a better taught class. The most significant findings in Blau's research were:

> The factor that has the strongest effect on the educational progress of undergraduates is the proportion of graduate students in the academic institution. . . . The time the faculty is able and willing to devote to undergraduates affects their educational progress . . . . concern among the faculty with scholarly research apparently encroaches on the time and effort they devote to teaching and reduces their effectiveness as teachers (1973, pp. 221, 224, 225).

Much of the significant research on the lecture method has revealed that "the lecture is open to serious criticism if used as an all-purpose teaching method" (Gage 1976, p. 296). Authorities have concluded the lecture approach is normally not capable of carrying the weight imposed by the variety of educational objectives that currently must be met by postsecondary institutions. It pays too little regard to individual differences among students. Ashby has stated that research results indicate "for formal lectures large classes are better than small ones, if only for the simple reason that the lecturer takes more trouble to prepare them," and "there is no evidence that teaching is always more effective if the groups are very small" (1974, pp. 26-27). Grobe and Pettibone have studied instructional pace and have found it an important variable in modifying student attentive behavior. Individual attention increases as instructional pace increases (1975, p. 134).

Seminars have received their share of research attention. According to one study of student evaluations at 16 colleges and universities, students rated small seminars and giant lectures as more effective than courses of intermediate size (*The Chronicle of Higher Education*, December 2, 1974, p. 2; see also Gage 1976, pp. 292-293).

Grabiner's 1975 report on a unit of California State, which was established to test whether a substantial number of students could accelerate their progress toward a bachelor's degree, contains encouraging information that might be applicable elsewhere. Particularly interesting is the description of "Intensity Week," a period during which no regular classes were scheduled so that special, intense learning experiences could be undertaken by faculty and students.

Another report worth noting is Halinski's and Tcheng's 1974 summary of 35 innovative projects to improve the quality of instruction,

involving 20 percent of the faculty at Illinois State University at an investment of one-half million dollars. One of these projects involved the restructuring of three courses into a single competency-based course. Another used professional actors to present live dramatizations in regular classes. Some 50 faculty members received small grants to develop innovative instructional practices.

Research on effectiveness of instructional technology appears to show mixed results. Cross, reporting on some one-hundred research studies of programmed instruction, concluded that the findings "fall short of justifying the investment of money, time and personnel that is required to create programs of high quality" (1976, p. 57). Hansen has examined the extensive research conducted on computer-based instruction at Florida State and concluded:

> CAI investigators can report their principal finding: the context of computer-based training is broader than our original conception and profits best from a management model for instruction. There is no singular way to individualize instruction to its optimal level without employing some of the older techniques, such as group discussion, or the newest ones, such as multi-media split-screen presentations (Harrison and Stolurow 1975, p. 128).

Halinski and Tcheng, on the other hand, have reported that there has been a significant increase in student satisfaction ratings for videotaped instruction. They have cautioned, however, that any move toward introducing instructional technology methods must be carefully planned, adequately funded, and well coordinated (1974, p. 5).

Some research results tend to be contradictory. For instance, Goodman et al., reporting on an experiment using a module approach to instruction, discovered that the completion rate was only 17 percent. They concluded that, "despite the specificity of the learning program, the accessibility of the instructors, and the flexibility of the time schedule of the course, most students who enrolled in it did not and/or could not handle the self-management of the learning process" (1974, p. 199). At the other extreme, Jernstedt's research on the relative effectiveness of individualized and traditional instructional techniques led him to conclude that "individualized teaching methods produce better performance than traditional methods" (1976, p. 218).

Research on PSI

The most exciting research results have been those that reported on the effectiveness of personalized self-instruction. Ruskin (1974) and Hursh (1976) have been impressed with the evidence that supports the

claims of proponents of PSI. Professors evaluating this method in an introductory political science course at Southwest Texas State University found that self-paced students performed better on tests than their students in a traditionally taught section. A five-year evaluation of student performance in a Harvard economics course revealed that self-paced instruction produced a 10- to 15-percent improvement in test scores, with an even higher rate of improvement among minority students (*The New York Times*, May 1, 1977).

The most significant article written on the superiority of PSI over conventional teaching methods is that written by Taveggia. He examined the findings of 14 different studies published between 1967 and 1974 that compared student achievement in PSI and in convential courses, concluding that "when evaluated by average student performance on course content examinations, the Personalized System of Instruction has proven superior to the conventional teaching methods with which it has been compared (1976, p. 1029). Furthermore, his analysis of research observations led him to conclude that students in PSI spend more time studying for these courses than they do for conventional ones. He believes that the use of student proctors also accounts for the superiority of PSI. He notes that PSI courses have higher dropout rates, particularly among lower-ability students. Other current research studies confirm Taveggia's interpretation. It seems evident that PSI shows great promise as an effective instructional style and it is likely to attract increasing numbers of supporters in the future.

Whatever the research studies reveal, however, a majority of students exposed to it become strong proponents of it. Almost invariably they feel that they learn more from personalized instruction than from lecture techniques (Kulik et al. 1974, p. 383).

Research on Faculty Development Programs

If the research on instructional methods needs improvement, so does the research on faculty development programs. Indeed, it is too early to expect rigorous and continued evaluation of those centers and institutes that focus on improving the quality of faculty. However, they must be undertaken in time, and research on these programs should be done by persons who do not have a stake in their operation or administration.

While few faculty development programs have been carefully and systematically evaluated, there has been research on those qualities in faculty members that promote excellent teaching. Gaff, who sent a questionnaire to students and faculty to solicit their nominations of

influential teachers, found that the persons nominated were significantly more likely to talk with students about a variety of contemporary issues and concerns than the average instructor. He discovered that "the single biggest difference between influential faculty and their colleagues is the extent to which they interact with students outside the classroom" (1973, p. 609). In his research Blau found that good teaching and productive scholarship were not incompatible but that they did not necessarily go hand in hand (1973, p. 274). In a study at the University of Utah, Grant found that faculty rank was not related to student course evaluation and that there was little relationship between faculty allocation of time to a course and student evaluation of it. However, as faculty allocation of time to research and writing increased, student course ratings decreased (1971, pp. 405-410).

With respect to studies on teaching effectiveness, student perceptions of reality are probably more important to consider than reality itself. In Baird's study of student attitudes in two-year colleges he discovered that students' perceptions of teaching styles had significant influence on their reactions to their college experiences and particularly to how they viewed the quality of instruction they had received. The index of instructor's "warmth," for instance, was positively related to ratings of teaching effectiveness (1973, p. 19). These results conform with Eble's findings that students are most turned-off by instructors who either do not care or who do not seem to care (1972, p. 22).

One of the most interesting research efforts on faculty was a study by Sherman and Blackburn, which examined the relationship between observed faculty personal characteristics and judged teaching effectiveness. They found that personality and superior teaching performance were highly correlated; especially significant were traits such as "dynamic," "pragmatic," "amiable," and "highly intellectually competent." Their research at a liberal arts college revealed that improvement of teacher effectiveness depends more on personality changes than on varied classroom procedures. The implications of these findings are worth pondering. As Sherman and Blackburn point out, personality traits are more enduring and consequently more difficult to change than the fundamental behavior and skills typically associated with outstanding teaching (such as clearness of assignments, fairness of tests, good use of class time, etc). Therefore, they reason "a professor wishing to improve his perceived effectiveness may best begin on personal attributes rather than focus his energy on course functions

and activities which, on the surface, seem more readily open to alteration" (1975, p. 130). Similarly, they believe that when a college recruits a new faculty member, careful attention should be paid to his or her personality and to those extra-professional characteristics that could influence teaching style.

The generalization seems valid that individual faculty members and programs designed to improve the quality of instruction should devote more attention to improving those personality traits in human beings that result in closer, warmer, more open relations between the teacher and the student. It would seem evident that all the effort in the world to improve skills is fruitless if the one using those skills has a negative or closed-minded attitude toward the persons he is trying to teach.

Conclusion

A review of over 200 books and articles on improving instruction and on improving college and university instructors produces two conflicting reactions. First, it is evident that there are many fascinating and encouraging innovations being undertaken to raise the quality of college teaching. A perusal of *The Yellow Pages of Undergraduate Innovations* (Maas 1974) leaves one impressed with the scope and variety of new educational activities. The books on faculty development programs, such as the two *Handbooks* by Berquist and Phillips (1975, 1977), the AASCU publication, *Faculty and Staff Development* (Alm 1976) and *Faculty Development Centers in Southern Universities* (Crow 1976) reveal the wide range of efforts being made to upgrade the college teaching profession.

It is also evident that although there has been change in higher education, it has not been sufficiently extensive. Several authors have observed that in spite of many innovative efforts, the bulk of higher education has changed very little in the last decade (Sikes et al. 1974, p. 26). Those faculty who most need help in improving their instruction are probably not receiving it. Those students who would most benefit from innovative instruction methods are plodding along in conventional classes.

There continue to be a number of deterrents to more extensive instructional reform in higher education. Unfortunately, too many faculty members and administrators possess mind-sets that hinder or obstruct innovation. Too many members of the academic profession are characterized by apathy, insecurity, lack of self-confidence, unwillingness to take risks, excessive attention to campus politics, excessive interest in professionalization, and mediocrity. What is especially troublesome to contemplate is that as faculties age there will be more need for faculty development to counteract the tendency of persons to become more conservative as they age. Where there are not such programs, we face the likelihood that faculty will be less open to innovation in the future. What is needed in higher education are professors and administrators who are creative leaders with a genuine interest in the student and in helping him or her learn. Higher education should have bold, talented persons willing to take that leap into the unknown, to work on improving their teaching methods, and to approach innovation with an open mind.

One serious roadblock to more rapid and extensive improvement in the quality of instruction is the nature and orientation of traditional graduate education. Although examination of the role of the graduate school in training future faculty members is beyond the scope of this study, it is evident from the many references made to it in the literature about undergraduate instruction that many educators are critical of graduate education in this regard. At a time when there are not enough positions available in colleges and universities for all those earning doctoral degrees, it is especially imperative that graduate schools respond more positively to the need to provide more adequate training in teaching skills.

Regardless of the resistance of traditionalism, it seems likely that more change, and more rapid change, will take place in the future. It is ironic that just at the time when many factors point to the need for reform of instruction, institutions of higher learning are being hard pressed financially. Colleges fighting for survival, and those seeking to raise the quality of their programs, find that they cannot afford to undertake extensive innovation, nor can they afford not to do so. As Stolurow has pointed out, economic conditions will force institutions to change, but they will have to proceed cautiously with careful planning to conserve the scarce resources available to them (Harrison and Stolurow 1975, p. 249).

Indeed, there are some who believe that the very survival of higher education as a viable enterprise depends on institutions accepting the imperative for change. Ruskin expressed this view in these words:

> No longer can innovation in educational technology like PSI be received as an interesting gimmick. Higher education, as a result of soaring costs, levelling enrollments, and decreasing finances, must look to educational technology to provide new types of quality educational systems (1974a, p. 38).

Diamond echoed that position when he declared, "the future of some institutions may depend ultimately on how well they can restructure, within the next few years, both what they do and how they do it" (1975, p. ix).

It seems inevitable that there will be more integrated use of the various instructional technologies in more courses and on more campuses in the future. There is likely to be more imaginative use of self-paced programs, of the audio-tutorial system, of internships and independent study. There is bound to be more flexibility. The relative cost of using computers and television in instruction will probably decrease. The introduction of the videodisc will revolutionize teaching

on some campuses. The successful use of innovative instructional methods will widen further the gap between the strongest institutions and the weakest and may accelerate the process that in biological evolution we call survival of the fittest.

There will also be innovation in ways that will further transform the profile of higher education. Axelrod has stated that "the major pressure for reform during the next ten or more years will not be directed to courses taught by professors in university classrooms." The pressures will be manifested most visibly in an increase of 'non-traditional' study courses, where students will acquire a body of cognitive knowledge or a set of skills—and receive academic credit toward their degree—without having to sit in a classroom at all (1973b, pp. 183-184).

Five major observations emerge as a result of this review:

1. There is no single method, no single formula for achieving the goal of improved instruction. Successful faculty development programs differ in their content and approach. Instructors are achieving superior results with a variety of teaching styles. However, on the basis of research studies to date, the most promising method for enhancing learning appears to be PSI.

2. The role of the professor's personality is crucial to the effectiveness of the instructional experience. Changing methodology alone is not enough. The individual faculty member must realize how important his own attitudes and personality traits are to the enhancement of learning.

3. The kind of instructional innovations attempted, and the kind of faculty development program implemented, must be in harmony with the particular objectives, traditions, and character of the institution. Furthermore, careful planning, communication, and widespread acceptance should precede the establishment of innovative programs.

4. Ultimately, instructional innovations have to result in extensive transformations of the structure, process, and concepts of higher education. Sweeping change will be needed in governance, departmental autonomy, faculty-administrative-student relations, attitudes toward the meaning of learning, and the role of faculty in the instructional experience. The instructional innovations about which we have been writing are not just a tinkering with the periphery of the higher educational experience. They have the potential for transforming the very heart and soul of higher education.

5. If higher education is to be reformed and transformed in this

fashion, it seems inevitable that massive financial support will be needed. Much can be done without funds from outside; but the real reform of higher education that would enable it to do a superior job of educating all students, of enabling them to reach toward their potential, will require funds from the federal and state governments, foundations, corporations, graduates and members of the general public. The 1980's will witness two acute energy crises in the United States: the depletion of precious natural resources, and the stagnation of valuable intellectual resources bound by traditional methods and narrow perspectives. It is essential that we conserve our natural resources and encourage our intellectual resources to find new ways of being more effective in improving instruction and facilitating learning.

It is a truism that the future of an educational institution rests on how effectively it meets the needs of its students and of the society that supports it. As the needs of students change, and as society itself changes, so too must the educational institution change. The instructional methods of the future must be based not on tradition or sentiment, but on a realistic evaluation of available resources, student needs, and societal needs.

What is required now is institutional renewal, faculty and administrative renewal, student renewal. Nothing short of the widespread transformation of higher education is likely to bring that about.

Looking to the future, can higher education evolve rapidly enough to survive? Can college teaching become sufficiently innovative to meet its responsibilities in the 1980's and 1990's? Although there has been progress in improving instruction, there is still much more that must be done before the last dull lecture is eliminated, the last deadening instructional routine is reversed. Unless the pace of creative innovation is increased, and unless there are dramatic improvements in the quality of instruction at a majority of institutions, the time may come when tourists on holiday will visit deserted campuses the same way Americans now visit Civil War battlefields, combining idle curiosity with a desire to discover the meaning of their departed past.

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